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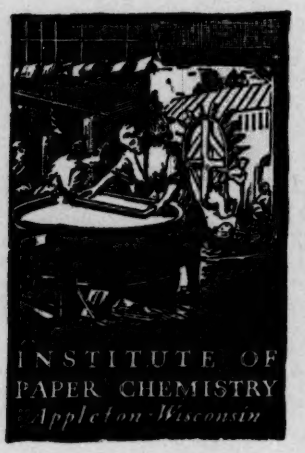
BULLETIN

OF

THE INSTITUTE OF PAPER CHEMISTRY



AFFILIATED WITH
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APPLETON, WISCONSIN

LIBRARY NOTES

OCTOBER · 1951
Volume 22 Number 2

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Books and Pamphlets Added to the Library During September

BIOLOGICAL CHEMISTRY

ANNUAL REVIEW of biochemistry. J. Murray Luck, editor; Hubert S. Loring and Gordon Mackinney, associate editors. Stanford, Annual Reviews, Inc., 1951. v. 20. 648 p.

CHEMISTRY—ORGANIC

BEILSTEIN, FRIEDRICH KONRAD. Beilsteins Handbuch der organischen Chemie. 4. Auflage. Zweites Ergänzungswerk, die Literatur von 1920-1929 umfassend, herausgegeben und bearbeitet von Friedrich Richter. Berlin, etc., Springer-Verlag, 1951. 15. Band. 433 p.

CHEMISTRY, ORGANIC—SYNTHESIS

ORGANIC SYNTHESES, an annual publication of satisfactory methods for the preparation of organic chemicals. R. S. Schreiber, editor-in-chief. New York, Wiley [c1951] v. 31. 122 p.

FISHERIES

TAYLOR, HARDEN F. Survey of marine fisheries of North Carolina. Chapel Hill, The University of North Carolina Press, 1951. 555 p.

IODINE

CHILEAN IODINE EDUCATIONAL BUREAU. Iodine; its properties and technical applications. New York, The Bureau, 1951. 74 p.

MINES AND MINERAL RESOURCES

U. S. BUREAU OF MINES. Minerals yearbook, 1949. Allan F. Matthews, editor; John Hozik, assistant editor. [Washington, U. S. Govt. Print. Off., 1951] 1662 p.

NEWSPRINT

U. S. SENATE. *Select Committee on Small Business. Subcommittee on Newsprint.* Supplies for a free press; a preliminary report on newsprint. Washington, U. S. Govt. Print. Off., 1951. 22 p.

PACKAGING

U. S. DEPARTMENT OF AGRICULTURE. *Production and Marketing Administration. Poultry Branch.* Recommended specifications for standard packs, containers, and packaging materials for poultry and poultry products. Agriculture handbook no. 25. [Washington, U. S. Govt. Print. Off., 1951] 89 p.

PAPER MAKING AND TRADE

ZELLSTOFFFABRIK WALDHOF. Das Waldhof Buch. [Mannheim-Waldhof] The company, 1951. 96 p.

PAPER MAKING AND TRADE—HISTORY

RENKER, ARMIN. Das Buch vom Papier. [3. neubearb. Aufl. Wiesbaden] Insel-Verlag, 1950. 230 p. + illustrations and samples.

PHOTOSYNTHESIS

RABINOWITCH, EUGENE I. Photosynthesis and related processes. New York, Interscience Publishers, 1951. v. 2, part 1. Spectroscopy and fluorescence of photosynthetic pigments; kinetics of photosynthesis. p. 603-1208.

TEXTILE INDUSTRY AND FABRICS—YEARBOOKS

AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS. 1951 technical manual and yearbook. New York, Publ. for the Association by Howes Publ. Co., Inc., c1951. v. 27. 610 p.

TRADE DIRECTORIES

PAPER AND PULP mill catalogue; engineering handbook (Collection of useful information) [comp. by Harry E. Weston] 1951-52. 28th annual ed. Chicago, Fritz Publications, Inc. [c1951] 528 p.

The PAPER MAKERS' & merchants' directory of all nations, 1951. 58th ed. London, Business Publications Ltd., 1951. 556 p.

SOURCE OF SUPPLY directory, 1951 ed. Chicago, Howard Publ. Co., 1951. v. 26. 828 p.

WOOD—CHEMISTRY

HÄGGLUND, ERIK. Chemistry of wood. New York, Academic Press Inc., 1951. 631 p.

WOOD-PULP

UNITED STATES PULP PRODUCERS ASSOCIATION. Wood pulp statistics, 1951 ed. New York, The Association, 1951. 221 p.

Survey of Periodical Articles

The following are abstracts of opinions expressed by writers in the technical journals. The Institute of Paper Chemistry takes no responsibility for the opinions here summarized.

BAGASSE

ANON. Aljian, Atchison and Lathrop team with Hawaiian sugar industry to study utilization of bagasse. Paper Trade J. 133, no. 10: 172-4 (Sept. 7, 1951); Chem. Eng. News 29, no. 37: 3720 (Sept. 10, 1951); Pulp Paper Mag. Can. 52, no. 10: 102 (September, 1951); Tappi 34, no. 10: 74A, 76A (October, 1951); Chemurgic Digest 10, no. 10: 14 (October, 1951); Fibre Containers 36, no. 10: 64 (October, 1951); Paper Mill News 74, no. 39: 26 (Sept. 29, 1951).

A large-scale project on the utilization of bagasse is under way in Hawaii, which is sponsored by the Hawaiian Sugar Planters Association and others; experts from the pulp and paper industry are joining with the sugar industry on this project. Several phases of activities seem imminent in this study, including the development of an efficient method for the separation of the pith from the fiber and suitable uses for the pith fraction, the determination of the suitability of the fiber for use in the pulp and paper industry, and an investigation of the possibilities of manufacturing chemicals from molasses and bagasse. E.S.

BEATING

RANCE, H. F. Symposium on beating. III. The beating process viewed as a problem of lubrication and lubricant behaviour. Proc. Tech. Sect., Brit. Paper and Board Makers' Assoc. 32, no. 2: 360-70; discussion: 371-413 (May, 1951); World's Paper Trade Rev. 136, no. 3: 177-80, 185-6 (July 19, 1951); *cf.* B.I.P.C. 22: 4-5.

The author views beating essentially as a lubrication process, the object of which is to alter the properties of the lubricant itself; this concept is by no means new (*cf.* Gartshore, B.I.P.C. 16: 71-2), although the present work provides probably for the first time an appropriate quantitative basis of experimental data. A comparison between oil-metal lubrication and the beating process is made, with emphasis on the similarity and differences between the two. Typical curves for a fully enclosed journal bearing (I) and the shell setting of a high-speed refiner (II) are presented which indicate a remarkable similarity and offer indirect evidence of the occurrence of successive phases of fluid (hydrodynamic) lubrication, boundary lubrication, and lubrication breakdown, followed by excessive metal wear in (II); the only difference between (I) and (II) is that in the latter case the coefficient of friction remains constant during the apparent fluid lubrication phase, instead of decreasing with increasing pressure as in (I). The influence of peripheral speed is listed as the possible reason of the jordan giving a higher rate of cutting than the high-speed refiner in the previous article of this series; the jordan was operated under conditions of lubrication breakdown, i.e., with a pressure and peripheral speed that a stable lubricant film could not be maintained with the particular bar design and pattern. The ideal in oil lubrication is the maintenance of the oil film in unaltered condition, whereas in beating a change in character of the lubricant is desired. There is no definite answer to the question whether or not a pulp should be a good lubricant from the viewpoint of efficient beating, because

much will depend upon the desired results. The best conditions for obtaining a particular type of product from a particular pulp depend essentially upon the intrinsic quality of that pulp. It seems that some kind of assessment of the load and/or gap-holding capacity of a pulp should preferably precede and to some extent predetermine the conditions of the standard beating to which a pulp should be subjected. 11 tables, 14 figures, and 6 references. E.S.

BLACK LIQUOR—OXIDATION

BIALKOWSKY, H. W., and DEHAAS, GERRETT G. Stabilization of Douglas fir kraft black liquor. Paper Mill News 74, no. 35: 14-16, 20, 22 (Sept. 1, 1951).

The development of equipment and procedures for the stabilization of Douglas-fir kraft black liquor by oxidation in a tower is described. Laboratory and pilot-plant data are presented on the surface requirements for complete oxidation of the liquor at various liquor and air-flow rates. Laboratory techniques are described which demonstrate the beneficial effects of liquor stabilization on the treatment of black liquor in direct-contact evaporators. A mill-scale tower was then installed which is capable of handling 300 gallons of black liquor per minute. This tower has been in operation for a period of over six months, and there has been a material reduction in hydrogen sulfide sulfur losses, as well as a noticeable decrease in atmospheric pollution. No serious foaming difficulties were encountered. 4 tables, 2 figures, and 6 references. E.S.

BLEACHING

NORDLUND, GÖRAN. Hypochlorite bleaching of sulfite pulp with the addition of calcium bromide. Paper and Timber 33, no. 8: 249-50 (August, 1951). [In Swedish; English summary]

Laboratory and mill experiments are described for bleaching sulfite pulp with the addition of calcium bromide in the hypochlorite stage. The following advantages were realized: a somewhat stronger pulp with higher α-cellulose content and lower copper number, heat economies, and a shorter bleaching period. The disadvantages include a somewhat higher pitch and ash content and poorer cleanliness; a whiteness value higher than 3 (according to the method of the Central Laboratory) can probably not be realized. These results are in agreement with the data reported by Giertz (*cf.* review by Hägglund, B.I.P.C. 17: 651-2). E.S.

BLEACHING—GROUNDWOOD

PREMO, R. A. One man bleach plant; Gould makes up to 130 tons a day. Pulp & Paper 25, no. 10: 55-6, 58 (September, 1951); *cf.* B.I.P.C. 21: 764.

An illustrated description of the peroxide bleach plant of the Gould Paper Co., Lyons Falls, N.Y. is given; essentially the same information is presented as in the previous article. 1 flowsheet and 7 illustrations. E.S.

BLEACHING—SULFATE

ANON. Harmac bleach plant uses Swedish process. Paper Ind. 33, no. 6: 672 (September, 1951); *cf.* B.I.P.C. 21: 682-3.

Essentially the same information as in the previous reference is given. 2 illustrations. E.S.

BOARD

R. S. ARIES & ASSOCIATES, *New York*. Structural board by the mile. Modern Plastics 29, no. 1: 80-2 (September, 1951).

The process for making Celloboard, a structural board made from wood waste and plastic resin, is described. In the process, which was developed in England, the press operates continuously, radio-frequency heating is used, and the length of the board is limited only by considerations of storage and transportation. The board contains 95% wood waste material and 5% resin (urea resin in most cases, although phenolic resins can be used where a high moisture resistance is desirable). The Celloboard press also includes the necessary equipment for providing a paper surface for decorative board. A wide range of raw materials may be utilized in making the board, and its applications are as varied as those of plywood or lumber in general. 6 illustrations. M.W.

HOHF, J. P. Board materials from sawdust and shavings. Wood 56, no. 8: 49 (August, 1951).

Board materials which are produced from wood waste by the wet-forming process have found limited commercial application, but because this process is confined to coarser types of wood, interest has centered on dry-forming or semidry-forming processes in which sawdust, wood shavings, etc., can be utilized. Several types of resin-bonded board have been produced by these processes, and it has been found that they can be manufactured in smaller plants at less cost for installation than wet-formed boards. Although the dry-formed boards are more expensive, this is offset by their special hardness and nail- and screw-holding properties. M.W.

BOARD—STATISTICS

NEWBURG, ALWIN A., BETTENDORF, HARRY J., and HELME, ROY V., JR. Paperboard mill industry statistics. Fibre Containers 36, no. 8: 140-51 (August, 1951); *cf.* B.I.P.C. 20: 5.

In 1950, the paperboard industry produced 10,970,800 tons, exceeding the previous high-production year of 1948 by almost 1.5 million tons; seven grades (output of cylinder machines) showed a decline from previous years, and five grades (Fourdrinier board) new all-time highs. The first six months of 1951 were at an even higher level of production. At the present time there is not believed to be any idle capacity in the industry. Tabulated statistical data, diagrams, and pie and block charts are included in the article. E.S.

BOARD, CORRUGATED

KOTTE [HANS] Recent advances in the American corrugated-board industry. Allg. Papier-Rundschau no. 12: 500-2 (June 26, 1951). [In German]

Reference is made to Buggie's improved process for printing corrugated board (*cf.* B.I.P.C. 21: 486-7), Killinger's resination process for corrugating starches (*cf.* B.I.P.C. 21: 610-11), and the right-angle take-off table developed by Fairfield Paper & Container Co. (*cf.* B.I.P.C. 21: 556). 6 figures. E.S.

BOARD DRYING

CROWDER, LAWRENCE C. Drying 800 tons kraft board daily on one machine. Tappi 34, no. 9: 415-19 (September, 1951).

The drying of a quantity in excess of 800 tons per 24 hours of kraft board on one machine at the mill of the Macon Kraft Co., Macon, Ga. entails the handling of quantities of stock, steam, water, and air, and the provision of power supplies which are rather unusual in the industry. The author presents a description of the equipment, including the quantities of the above ma-

terials and services used in producing such results, a calculation of drying and evaporation rates, and a comparison of these rates with earlier published figures. 4 figures and 2 references. E.S.

BOARD MILLS

ANON. Ireland's new board mills. World's Paper Trade Rev. 136, no. 7: 490, 492 (Aug. 16, 1951).

A brief reference is made to the National Board and Paper Mills Ltd., near Waterford, Ireland, now under construction, which will comprise a board mill (three Hydrapulpers, four Hydrafiners, and one board machine) and a box factory. All equipment is new and of the latest design with the exception of the seven-vat board machine which was purchased from the International Paper Co. at Three Rivers, Mich. The Black-Clawson Co. dismantled the machine and moved it to their plant at Hamilton, Ohio for a complete overhaul and modernization. It will have a capacity of 600 tons per week. The start of operations is planned for October, 1952. 3 illustrations. E.S.

PALM, W. H. Strawboard mill layout at Hinde and Dauch, Trenton, Ont. Tappi 34, no. 9: 124A; discussion: 124-5A (September, 1951).

A brief outline is given of the installations of the Trenton strawboard mill, the principal product of which is at present .009 corrugating medium with a small percentage of .009 facing material. Special reference is made to new cutting arrangements whereby all the straw is cut in a specially designed chopper, and to the numerous advantages obtained as a result of this improvement. E.S.

BOARD SPECIALTIES

EDLO, INC., *San Francisco.* An easy way to take home your two quarts of milk. Packaging Parade 19, no. 224: 56 (September, 1951).

The 2-PAK carrier consists of a cardboard strip which locks around two one-quart milk cartons to facilitate carrying. Pulling a tab unlocks and frees the strip so that quarts can be stored as single units. A patent is pending on the design. 3 illustrations. M.W.

BOARD TESTING—PHYSICAL

ANON. Testing raw materials for box and bag making. Paper Container 62, no. 2: 33, 35; no. 3: 61, 63; no. 4: 89, 91; no. 5: 117, 119; no. 6: 147; 63, no. 1: 5; no. 2: 37, 39; no. 3: 67, 69; no. 4: 95, 97; no. 5: 123; no. 6: 151, 153; 64, no. 1: 5, 7; no. 2: 37, 39; no. 3: 65, 67; no. 4: 93; no. 5: 121, 123; no. 6: 149, 151; 65, no. 1: 5; no. 2: 33, 35; no. 3: 61, 63 (February, 1950-September, 1951).

This is a revision of a series of articles which appeared in the same journal more than 20 years ago. Included are tests of board strength and rigidity, water-vapor permeability, air permeability, etc., of boards, and tensile strength, folding strength, and opacity tests for paper, and tests for adhesives, cellulose films, and glues. Information on the evaluation of the tests is also provided. 15 figures. M.W.

FIBREBOARD PRODUCTS CORPORATION, *Antioch, Calif.* G-E beta

ray gage helps maintain uniform weight of paperboard; also may be applied to plastics, metals. Packaging Parade 19, no. 224: 66 (September, 1951); Tappi 34, no. 10: 80A, 82A (October, 1951); *cf.* B.I.P.C. 19: 795.

Variations as small as 1% in the weight per unit area of milk carton paperboard are automatically indicated and recorded by a General Electric beta-ray gage. The amount of beta rays which are absorbed is proportional to the weight of the material being measured, and since the gage is not affected by speed, consistency, or temperature, it may also be used with plastics, metals, and special sheet materials. 2 illustrations. M.W.

BONDED FIBER WEBS

ELLIOTT, G. H. Bonded fibre fabrics. J. Textile Inst. 42, no. 8: P661-72; discussion: P672-4 (August, 1951).

The author discusses methods of bonding fibers and producing bonded fabrics, machinery employed, physical characteristics of the products, methods of testing, applications, and various finishing treatments and their effects. 3 tables, 1 figure, and 14 references. M.W.

CARBOHYDRATES

FISCHER, H. O. L., and MACDONALD, D. L. Carbohydrate chemistry. Ann. Rev. Biochem. 20: 43-66 (1951).

A review of developments in carbohydrate chemistry during 1949 and 1950 is presented. It is concerned for the most part with sugars; about eight references deal with cellulose. M.W.

CELLULOSE

CALKIN, JOHN B. The system cellulose-sodium hydroxide-water. Determination of the ionization constant of cellulose. Tappi 34, no. 9: 108-12A (September, 1951).

With the existence of a compound formation between sodium hydroxide and cellulose established (*cf.* B.I.P.C. 6: 263), it is possible to express the ionization constant of cellulose as an acid. By use of the thermodynamic equation of the colloidal membrane equilibrium, the apparent ionization constant (I) of various forms of cellulose in the system cellulose-sodium hydroxide-water has been determined experimentally. Cellulose in different forms has been brought to equilibrium in various sodium hydroxide solutions with the exclusion of air. The results of the work may be summarized as follows: By the use of the Donnan membrane equilibrium and on the basis of certain implicit assumptions, a derivation for the determination of (I) of cellulose is given. It is shown that the (I) of cellulose differs with alkali concentration. The (I) for different types of cellulose are presented. The (I) of cotton pretreated with caustic soda is shown to increase with increasing concentration of caustic soda for the pretreatment. Theoretical considerations are in accord with the experimental fact that the (I) may vary with the concentration of the sodium hydroxide solution. 4 tables and 17 references. E.S.

CHAMPETIER, G., and ASHAR, KANJI G. The alkali celluloses: study of the systems cellulose-sodium hydroxide-water, cellulose-potassium hydroxide-water, and cellulose-lithium hydroxide-water. Makromol. Chem. 6, Staudinger-Festband: 85-93 (March, 1951). [In French; German summary]

By applying the Schreinemaker method to the cellulose-alkali-water systems, using different alkalies, the authors determined those quantities of alkali and water which react with the hydroxyl groups in cellulose to form defined chemical molecular (addition) compounds. These compounds contain no water of hydration; their formation is the result of a topochemical reaction. Within certain ranges of concentration, the aqueous solutions of potassium and sodium hydroxide combine with cellulose in simple stoichiometric proportions, whereas no such proportion is noticeable when lithium hydroxide is used. This alkali continues to be topochemically combined, tending to reach a limiting value. 3 tables, 2 figures, and 13 footnotes.
E.H.

LEGRAND, CH. Studies on cellulose III regenerated from ammonia cellulose. J. Polymer Sci. 7, no. 2/3: 333-9 (August-September, 1951). [In French]

The study of cellulose from swelled derivatives obtained by the treatment of native and mercerized cellulose with liquid ammonia leads to the definition of two corresponding forms which depend on the starting material: cellulose IIIa and IIIb. With water, pattern IIIa gives an enlarged pattern, whereas pattern IIIb leads to cellulose II. The elementary cells of cellulose IIIa and IIIb, both of the monoclinic type, show a slight difference. 4 tables and 11 references. E.S.

CELLULOSE ESTERS—NITROCELLULOSE

MOORE, W. R. The viscosities of dilute solutions of nitrocellulose. J. Polymer Sci. 7, no. 2/3: 175-89 (August-September, 1951).

The viscosities of dilute solutions (0.05, 0.1, and 0.2 g. per 100 ml.) of relatively high nitrogen-content nitrocelluloses, with weight-average molecular weights of about 100,000, have been studied using homologous series of methyl ketones, alkyl acetates, and dialkyl phthalates as solvents. The simple form of the Huggins equation, $\eta_{sp}/c = [\eta] + k'[\eta]^2 c$ does not appear to hold; plots of η_{sp}/c against c are generally curved. The results can be expressed by $\eta_{sp}/c = A + Bc + Cc^2$, where A equals $[\eta]$, and B the initial slope. The values of B and A appear to be related to solvent power as determined by the volume of hexane required to cause initial phase separation from the solution; good solvents give higher values of B and A than poor ones. The variation of B with solvent is more marked than that of $[\eta]$ and may reflect differences in degree of coiling of chains in different solvents. Values of $B/[\eta]^2$ (Huggins k') do not generally decrease with solvent power increase. The slopes of Martin plots divided by intrinsic viscosities are not generally related to solvent power in the manner observed by Spurlin with solutions of ethylcellulose. 6 tables, 11 figures, and 29 references. E.S.

CHEMICAL TESTING—CELLULOSE

FRAMPTON, VERNON L., FOLEY, LUCIA PEEPLES, SMITH, LELAND L., and MALONE, JANE G. Quantitative application of the Kiliani reaction. Anal. Chem. 23, no. 9: 1244-7 (September, 1951).

An analytical procedure for aldoses is described which may be used satisfactorily in end-group determinations with cellulose. The procedure depends upon the quantitative addition of hydrocyanic acid by aldoses at pH 8.5 and 39°C. The nitrile which results from the addition is hydrolyzed in an alkaline medium to stoichiometric proportions of ammonia, which is then determined titrimetrically. An ammonia blank must be determined with the reagents because of the spontaneous hydrolysis of hydrocyanic acid solutions. 5 tables, 4 figures, and 5 references. M.W.

CHEMICAL TESTING—PAPER

WILSON, WILLIAM K., HARVEY, JACK L., and PADGETT, ALICE A. Effect of melamine resin on chemical tests of paper. Tappi 34, no. 9: 410-15 (September, 1951).

A study of the effect of the presence of melamine-formaldehyde resin (MR) in paper on various chemical tests applied to paper is reported. Included are the determinations of α-, β-, and γ-cellulose, copper number, pH, rosin, cuprammonium fluidity, and the heat-stability test. It was found that addition of MR generally increases the α-cellulose fraction, at the expense of the β-portion. The α-cellulose fraction retains 70 to 85% of the MR. A decrease in copper number occurs; papers having a D.P. of 1000 or more are rendered only partially soluble in cuprammonium solvent; the analysis for rosin is unaffected. During hot-water extraction MR releases alkaline decomposition products; the hot-extraction pH of paper therefore depends primarily on the relative amounts of alum and MR present. As measured by the changes occurring in α-cellulose and copper number on accelerated oven aging, MR exhibits a tendency to stabilize papers. 6 tables, 2 figures, and 13 references. E.S.

CHEMICAL TESTING—PULP—CUPRIETHYLENE VISCOSITY

PARISOT, A., and CYROT, J. The degree of polymerisation of cellulose; causes of errors in determinations by the viscosimetric method. J. Textile Inst. 42, no. 8: P783-95; discussion: P795-7 (August, 1951).

The following factors which may be responsible for introducing errors in the viscometric determination of the D.P. of cellulose are discussed: internal impurities (various groups of atoms which differ from the repeating unit of a macromolecule), external impurities (lignin, pectin, etc.), the problem of finding a suitable solvent for cellulose, the influence of the apparatus, temperature, and oxidation, and the difficulty of expressing the D.P. as a function of the specific viscosity and of the concentration. The authors recommend the use of cupriethylenediamine as the solvent and suggest the replacement of the D.P. with the value of intrinsic viscosity which can be derived from the equation: $\log \eta_{sp}/c = \log [\eta] + K[\eta]c$. 1 table, 7 figures, and 24 references. M.W.

CHEMICAL TESTING—WAX

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY. Oil content of petroleum waxes. Tappi 34, no. 9: 140-2A (September, 1951).

The text of TAPPI Suggested Method T 636 sm-51 is presented, which is a modification of A.S.T.M. Designation: D 721-51 T which, in turn, is based upon the method of Lee and Kalichewsky (*cf.* Ind. Eng. Chem., Anal. Ed. 14: 767-9 [1942]). The method describes a procedure for the determination of the amount of oil in petroleum waxes which have melting points of 105°F. or higher and contain not over 15% of oil. The sample is dissolved in methyl ethyl ketone, and the solution is cooled to −25° to precipitate the wax and filtered. The oil content of the filtrate is determined by evaporating the solvent and weighing the residue. The details of the apparatus, solvent, test specimen, procedure, and method of reporting are given. 3 tables, 4 figures, and 1 reference. E.S.

CHIPS

NORTHEASTERN WOOD UTILIZATION COUNCIL. Check-up meeting

on chipped wood. Northeastern Wood Utilization Council, Wood Notes no. 16: 1-3 (August, 1951).

Additional information is presented to supplement the Council's Bulletin no. 33, "Chipped wood production and use" (*cf.* B.I.P.C. 21: 389-90).

M.W.

CHROMATOGRAPHY

KRITCHEVSKY, THEODORE H., and TISELIUS, ARNE. Reversed phase partition chromatography of steroids on silicone-treated paper. Science 114, no. 2960: 299-300 (Sept. 21, 1951).

A procedure in which steroid mixtures were separated by the application of reversed-phase partition chromatography on filter paper is presented. The paper was rendered hydrophobic by drawing it through a solution of Dow Corning Silicone No. 1107 in cyclohexane and heating it at 110°C. for one hour. The treated paper readily absorbed vapors of nonpolar substances, and the properties of the paper were not changed by washing with organic solvents. The partition system which was employed consisted of chloroform as the nonpolar phase and ethanol-water as the polar phase. The mixtures to be analyzed were applied in a chloroform solution, and chloroform was incorporated into the paper by adsorption of the vapors. The chromatogram was developed with the alcohol-water phase in the conventional descending manner. Because of the sensitivity of the R_F values to small differences in the amount of silicone incorporated in the paper, relative, rather than absolute, R_F values were calculated based on the slowest moving steroid in the series. 1 table and 8 references. M.W.

COLORIMETRY

VAN DEN AKKER, J. A., APRISON, MORRIS, and OLSON, O. H. Instrumentation studies. LXV. A study of photoelectric instruments for the measurement of color. Reflectance and transmittance. IX. The Hunter Color and Color-Difference Meter. Tappi 34, no. 9: 143-58A (September, 1951); *cf.* B.I.P.C. 22: 36.

The Hunter Color and Color-Difference Meter (I) is designed to measure color and small color differences by means of the three-filter photoelectric method of colorimetry; it is arranged to yield data in terms of Hunter's color diagram, in which a unit of color difference is intended to correspond to a uniform difference in color perception throughout the color solid. The I.C.I. tristimulus values are not determined. (I) is intended to be used for color control and cannot be employed for the determination of spectral reflectance curves, or for the measurement of papermakers' brightness. The values of R_d, a, and b are measured by reference to a color standard which has colorimetric characteristics similar to those of the sample. The principal concern in this study relates to the question of whether or not (I) would be satisfactory for the production control of color and to means for possible improvements. The defects of the particular instrument studied are discussed in detail, as well as the possibilities for improving it. The most serious defect was found in the indication of b values which relate to yellowness and blueness. The instrument is definitely a promising, but not yet satisfactory device for the mill control of color. 17 tables, 13 figures, and 9 references. E.S.

CONTAINER INDUSTRY

BETTENDORF, HARRY J., and HELME, ROY V., JR. Statistical summary of the paperboard group of industries. Fibre Containers 36,

no. 8: 72, 74, 76, 81-2, 84, 86, 88, 93-4, 96, 98-100, 105-6, 108, 110, 112-21 (August, 1951); *cf.* B.I.P.C. 21: 10.

Following a brief introduction on the uncertainties of the international and national picture, the initial over-all statistical summary deals with the growth of the mass-production package, some size comparisons, the growth through new uses, capacity growth, general industry trends (including pulpwood and pulp, waste paper, paperboard, fiber boxes, folding cartons, and fiber cans and tubes), government war activities, and general emergency effects. Significant comparisons are made, and the basic trends in connection with raw materials, board and paper, converted products, and government activities are drawn together. Numerous statistical tables and pie and block charts are included in the article. E.S.

CORROSION

SCHMIDT, H. W., GEGNER, P. J., HEINEMANN, G., POGACAR, C. F., and WYCHE, E. H. Stress corrosion cracking in alkaline solutions; Technical Practices Committee 5C—Sub-surface corrosion by alkaline solutions. Corrosion 7, no. 9: 295-302 (September, 1951).

A discussion is presented of the results of an industrial survey on the failure of materials in alkaline solutions; most of the data deal with sodium hydroxide. The relationship of temperature and concentration to cause failure can be expressed only in an approximate manner. Corrective measures that have been employed to eliminate failure are discussed. 3 tables, 7 figures, and 5 references. E.S.

WACHTER, A., SKEI, T., and STILLMAN, N. Dicyclohexylammonium nitrite, a volatile inhibitor for corrosion preventive packaging. Corrosion 7, no. 9: 284-94 (September, 1951).

Dicyclohexylammonium nitrite (Dichan, registered trademark by Shell Development Co.) is a powerful inhibitor of steel corrosion by fresh water. Since this nitrite salt is slightly volatile, it has commercial application in a new method for preventing the corrosion of packaged steel articles by the moisture that enters or is present within a package. It functions by vaporization and transport of its vapor to the metal surface where it condenses or dissolves in condensing moisture. The duration of protection is dependent upon the quantity of inhibitor present and the rate of loss as vapor and by decomposition. The compound has properties of chemical stability, compatibility, volatility, vapor transport, diffusion, solubility, and corrosion inhibition, that are important to its functions as an inhibitor in packages. The absence of undesirable effects with nonmetallic materials, nonferrous metals, bimetallic couples, and in manual handling are also of practical importance. A large number and variety of tests in the laboratory and in outdoor exposure racks have given information on the performance of the inhibitor under many different conditions. A dynamic corrosion test has been developed that is useful for the rapid evaluation of volatile corrosion inhibitors for packaging applications. The inhibitor is most conveniently and effectively employed in the form of a coating on wrapping papers or on paperboard containers; the correct application is essential for obtaining satisfactory results. 14 tables, 14 figures, and 6 references. E.S.

DE-INKING

PALLADINO, A. J. Progress in research on waste water from deinking plant. Paper Mill News 74, no. 37: 91-2 (Sept. 15, 1951); *cf.* B.I.P.C. 21: 314.

The Kalamazoo River Improvement Company has constructed a full-scale plant at the Michigan Paper Co., Plainwell, Mich., for the use of the "biological aeration" technique in the treatment of deinking waste water. The process includes primary settling, aeration, and secondary settling, and the equipment used in each phase is described. Although no data are yet available, it is anticipated that this treatment will effect approximately 70% reduction in B.O.D. and suspended solids concentration. 1 table and 2 illustrations. M.W.

WOLF, ROBERT B., JR. De-inking plant expansion includes major instrumentation. Paper Trade J. 133, no. 10: 112, 114 (Sept. 7, 1951).

Additional instrument facilities will be incorporated in the deinking plant enlargement and modernization at the Fitchburg Paper Co., Fitchburg, Mass. The equipment which will be automatically or manually controlled by instrumentation includes: three Hydrapulpers, a new high-density bleach tower, an IMPCO washer, and a consistency controller. In addition, levels and temperatures in important storage and process tanks will be controlled, and essential records will be provided by instruments. 1 illustration. M.W.

DIATOMACEOUS EARTH

ANON. Diatomaceous paper-aids; means to improvement and economical paper and board production. World's Paper Trade Rev. 136, no. 1: 41-4 (July 5, 1951).

The applications and resulting advantages of diatomaceous earth (Dicalite) additions to pulp and paper products are discussed (control of pitch and wax and asphalt contents; improvement in slime conditions and fiber formation; increased retention of fine fibers, fillers, and pigments; improved color and printability; faster drainage and improved vapor release on drier rolls; and higher machine speeds). The use of a different quality (Dicalite Speedplus) as a filter aid in white-water systems is also mentioned. 1 table, 1 flowsheet, and 2 photomicrographs. E.S.

ENGINEERING

LIVINGSTON, ROBERT TEVIOT. The industrial-management engineer and his place in society. Paper Mill News 74, no. 37: 36-8, 40, 44-5 (Sept. 15, 1951).

The industrial engineer is concerned with the design of the whole industrial enterprise, the determination of what to make, at what price, of the fixed and working capital requirements, and of the whole structure of communication, co-ordination, and control of an industrial association. He uses observation, analysis, and synthesis to determine the relationship which should exist, and he attempts to produce the most effective method of performing a unit operation. 2 references. M.W.

EUCALYPTUS

CHITTENDEN, A. E., COOMBER, H. E., and CORNEY, N. S. *Eucalyptus saligna* wood from South Africa. Colonial Plant and Animal Prod. 1, no. 4: 299-308 (1950); Paper-Maker 122, no. 3: 179-80, 182-3, 195 (September, 1951); World's Paper Trade Rev. 136, no. 10: 656, 658, 660, 662, 664, 667-8 (Sept. 6, 1951).

The suitability of *Eucalyptus saligna* as a source of pulp for papermaking

and for the manufacture of artificial silk was investigated. It was found that it was possible to produce satisfactory yields of unbleached soda or sulfite pulps under reasonable digestion conditions, but the pulps possessed poor strength. After beating, however, the strength was improved, and the pulps could be employed for the production of lower-grade wrapping papers. With standard single-stage alkaline hypochlorite bleaching, very severe conditions were required to obtain completely bleached pulps; the bleached pulps were, however, suitable for printing and writing papers where high strength is not a requirement. The α-, β-, and γ-cellulose contents of the unbleached sulfite pulp indicated that it was fairly satisfactory for the manufacture of dissolving pulp; the wood would have to be submitted to a more drastic treatment to increase the α-cellulose content to the necessary level. 9 tables and 2 references. M.W.

FERMENTATION PROCESS

LEE, SYLVAN B. Fermentation. Ind. Eng. Chem. 43, no. 9: 1948-69 (September, 1951); *cf.* B.I.P.C. 21: 86.

In the first section of this review, recent literature on various industrial fermentation processes is summarized; the second section is concerned with the factors of importance in the fermentation unit process. References to the production of ethyl alcohol, yeast, butyl alcohol-acetone, and lactic acid fermentations from spent sulfite liquor are included in both sections. 414 references. M.W.

FIBER—TESTING

HURLEY, R. E. Models for the dynamic properties of paper. Tappi 34, no. 9: 390-5 (September, 1951).

The characteristics of the fibers have been observed to be of importance in determining the significant properties of acoustical paper. This fact has led to the construction of models which closely duplicate the properties of acoustical paper. These mechanical analogs vary, depending on the degree of hydration of the paper which they represent and on the amount of pressure used in the manufacture of the paper. The author expresses the hope that the models may be of value in the statistical determination of the properties of papermaking fibers and lead to the establishment of measurable quantities to replace the qualitative terms which are at present still used to describe some fiber properties. 1 table, 9 figures, and 2 references. E.S.

FLOCCULATION

THODE, E. F., BEAMESDERFER, J. W., and PARSONS, R. D. Effect of additives on multifiber dispersions. Paper Trade J. 133, no. 12: 20, 22, 24, 26 (Sept. 21, 1951).

A study of the effect of various furnish additives on the dispersion of fibers in handsheets is reported. The criterion of dispersion here employed is the aerosol filtration efficiency of the paper. The only other physical property correlated with the chemical additive treatment is the tensile strength of the paper. It is believed that this use of filtration efficiency principally reveals the degree of dispersion of the fine fibers in a mixed fiber sheet. Thus, in part, the masking effect of flocculation caused by the purely mechanical entanglement of longer, more coarse fibers is avoided. With this concentration of attention on the finer fibers, purely chemical factors involved in flocculation may be studied. It is concluded from the results herein presented that the multifiber pulp suspensions used behave in a manner similar to negative, hydrophilic colloids as regards dispersion and coagulation. It was found that, although improvement of dispersion of fibers in

such suspensions could be accomplished by the addition of synthetic anionic dispersing agents, a severe loss in tensile strength of the paper accompanied such improvement in dispersion. This loss in tensile strength was overcome by the addition of carboxymethylcellulose as a bonding agent. 4 tables, 4 figures, and 7 references. E.S.

FOLDING BOXES

LE HOCKEY, DANIEL M., BETTENDORF, HARRY J., and HELME, ROY V., JR. Folding carton industry statistics. Fibre Containers 36, no. 8: 168, 170, 172, 174, 176, 181-2, 184, 186, 188, 190-2 (August, 1951); *cf.* B.I.P.C. 21: 15.

The year 1951 saw a phenomenal increase in the production of folding cartons, which followed two consecutive years of downtrend. The final quarter of 1950 showed a leveling off, but was followed by a peak in January, 1951; the second quarter of 1951 saw the usual seasonal drop in business, with shipments higher than orders for the first time since April, 1950. Shipments have remained at a fairly even keel since August, 1950, but orders have varied up and down. Apparently orders are now again in balance with shipments, following a period during which their balance had been considerably in excess of shipments. With regard to the steady growth of the industry and the unexpected downtrend in the period from 1947 to 1949, it is believed that in 1946 folding cartons had developed to a position out of keeping with the normal growth, so that the following years must be considered as an adjustment rather than the reaching of a state of maturity by the industry. Statistical details are given in tables and graphs, including a map with folding-carton zones in the United States. E.S.

FORESTS AND FORESTRY

COLLET, M. H. Conservation and our national emergency. Southern Pulp Paper Manuf. 14, no. 9: 26, 28 (September, 1951).

The author emphasizes the need for the maintenance and even increase in forestry conservation under present pressures from every quarter to set aside conservation work in the interest of all-out production. The cutting practices advocated by the Southern Pulpwood Conservation Association in the South will mean no significant reduction of raw material to the industry on a short-term basis, but they will certainly make a major contribution to the nation on a long-term basis. Conservation manpower will make a greater contribution to production by retention in their jobs than by reassignment to procurement or production work. E.S.

LEVÓN, MARTTI. The forestry of Argentina. IV. Paper and Timber (Finland) 33, no. 7: 236-40 (July, 1951). [In Finnish; English summary] *cf.* B.I.P.C. 21: 846.

The important economic tree species of Argentina and their suitability for different applications are discussed. 1 illustration. E.S.

FORESTS AND FORESTRY—EDUCATION

BERGESTAD, F. The Norwegian trade school for woodsworkers. Pulp Paper Mag. Can. 52, no. 9: 136, 138, 140, 142 (August, 1951).

The program of the school which was established in 1946 is described. The school may be attended, without fees, by any worker 17 years or older who has had at least one year of experience in the bush, and the subjects are of

a practical nature and concern, for the most part, the handling and care of tools and working technique. 3 figures. M.W.

FORMALDEHYDE

WILLIAMS, ROGER, JR. Why the formaldehyde boom? Chem. Eng. 58, no. 9: 369-72 (September, 1951).

The most important single factor in the recent growth of the formaldehyde industry is the rapid development of the phenolic, urea, and melamine resins. Three other formaldehyde derivatives, ethylene glycol, hexamine, and pentaerythritol, have also increased the demand. The methods for producing formaldehyde are limited to two basic categories: the oxidation of methanol and the oxidation of natural gas, methane, ethane, propane, or butane. Comparison of the total capacity now available with the end-use requirements for 1951 (estimated at 1 billion pounds) shows very little margin for increased demand, and the prediction of an annual demand of 1.5 billion pounds within the next two years would seem to indicate an increasing shortage. 2 tables and 2 illustrations. M.W.

GUAR

WHISTLER, ROY L., and DURSO, DONALD F. The isolation and characterization of two crystalline disaccharides from partial acid hydrolysis of guaran. J. Am. Chem. Soc. 73, no. 9: 4189-90 (September, 1951).

Partial acid hydrolysis of guaran leads to the isolation of two crystalline disaccharides. One of these, 4-(β-D-mannopyranosyl)-β-D-mannopyranose is identical with the mannobiose isolated from enzymatic hydrolysis of guaran. The other disaccharide is a new sugar and is reported here for the first time. It is 6-(α-D-galactopyranosyl)-β-D-mannopyranose. 20 footnotes. E.S.

WHISTLER, ROY L., AND STEIN, JOAN ZIMMERMAN. A crystalline mannobiose from the enzymatic hydrolysis of guaran. J. Am. Chem. Soc. 73, no. 9: 4187-8 (September, 1951).

By enzymatic hydrolysis of guaran there is obtained in 7% yield a crystalline mannobiose which is shown to be 4-(β-D-mannopyranosyl)-β-D-mannopyranose. This is the first isolation of the mannobiose. Its occurrence as a hydrolytic fragment of guaran suggests that β-1,4′-glycosidic linkages are present between D-mannose units in the polysaccharide. 11 footnotes. E.S.

HARD WOODS

CHITTENDEN, A. E., and COOMBER, H. E. The suitability of *Brachystegia, Isoberlinia* and other hardwoods of Northern Rhodesia for the manufacture of fibre boards. Colonial Plant and Animal Prod. 1, no. 4: 294-9 (1950); World's Paper Trade Rev. 136, no. 11: 780, 782 (Sept. 13, 1951).

Ultimate fibers were prepared from samples of several species of *Brachystegia* and *Isoberlinia* and measured under the microscope. The dimensions of the ultimates, the ratio of average length to average diameter, and short descriptions of the ultimates are given. All samples exhibited short ultimate fibers and are therefore unlikely to be suitable for manufacturing fiberboard, although they could possibly be utilized in the manufacture of hardboard. The pulping qualities of these species have not been studied. 3 tables. M.W.

HEATING (HIGH-FREQUENCY)

DICKINSON, THOMAS A. High-frequency heaters used in paper converting. Am. Paper Converter 25, no. 9: 10-11 (September, 1951).

High-frequency processing, in which electronic heat energy is utilized to polymerize resinous impregnants and adhesives on dielectric materials is used in the production of various types of paper-plastic and metallic foil-paper laminates. Developments in the use of high-frequency electronic heating equipment, e.g., low-cost molds which consist of wood forms covered with metallic sheet materials, continue to extend the range of applications, and the use of high-frequency equipment can greatly increase the production of molded or laminated materials. 4 figures. M.W.

HISTORY

DONNELLY, FLORENCE. The pride of San Joaquin. Paper Maker [U. S.] 20, no. 2: 33-41 (September, 1951).

A description is given of the career of Rufus B. Lane, pioneer papermaker of Stockton, Calif., who built the California Paper Company Mill, which started operations in 1878. Its operation became unprofitable when wood pulp replaced rags and straw, and before the turn of the century, the mill could no longer withstand the competition from new mills in the north and ceased operations. Lane died in 1907. 5 illustrations. M.W.

ELLIOTT, HARRISON. John Baskerville (1706-1775). Paper Maker [U. S.] 20, no. 2: 11-15 (September, 1951).

The life and work of John Baskerville, type-founder, typographer, printer, and originator of wove paper is sketched briefly. 2 illustrations. M.W.

SULLIVAN, FRANK. Paper, papermaking, and the patriots. Paper Maker [U. S.] 20, no. 2: 27-31 (September, 1951).

The important role played by paper in the precipitation and prosecution of the Revolutionary War is discussed. 7 illustrations. M.W.

VOORN, HENK. Papermaking and papermakers of long ago in Holland. Paper Maker [U. S.] 20, no. 2: 1-9 (September, 1951).

The history of papermaking in the Netherlands is traced from its beginning in 1428 through 1680, the approximate date of the invention of the hollander beater. 20 illustrations and 5 references. M.W.

ILLUMINATION

ANON. Specialised lighting at Bridgend Paper Mills. Paper-Maker (London) 122, no. 2: 106-8 (August, 1951); World's Paper Trade Rev. 136, no. 5: 299-300, 302, 304 (Aug. 2, 1951); Paper & Print 24, no. 3: 298-300 (Autumn, 1951); *cf.* B.I.P.C. 21: 791.

The illumination scheme in the new Bridgend Paper Mills in England is described; tungsten-filament lamp units are employed for general lighting, and hot-cathode, fluorescent units have been adopted for special locations, such as the illumination over the paper-machine wires, the pulp-storage room and color matching, the finishing room, and over the cooking range in the canteen. 5 illustrations. E.S.

INTERIOR PACKING

MENASHA WOODEN WARE CORPORATION. 'Float packed' refrigerators. Packaging Parade 19, no. 224: 52-3 (September, 1951).

A protective interior pack, called Pillowpak, is described which is adaptable for the float packing of heavy durable goods such as kitchen appliances and furniture. A shock-absorbing outer corrugated pad is laminated to a nonabrasive facing made of Kimpak, Kimberly-Clark's creped-wadding cushioning material, to form a packing material which protects goods from dust and abrasion, eliminates the need for special provisions in design to accommodate heavy framing, and provides a reduction of production costs. 5 illustrations. M.W.

KRAFT PULP AND PAPER

HART, J. S., and STRAPP, R. K. Production of commercial-grade chemical pulps at the Pulp and Paper Research Institute of Canada. Pulp Paper Mag. Can. 52, no. 9: 103-6 (August, 1951); Proc. Tech. Sect., Can. Pulp Paper Assoc. 37: 207-10 (1951); *cf.* B.I.P.C. 22: 132.

The object of the present study was a comparison of easy-bleaching kraft pulps produced in the laboratory and mill under as similar conditions as possible. The pulp was cooked to a Roe number of approximately 3.5 in all three experimental digesters, and the resulting pulps were given complete chemical and physical tests; it was thus possible to assess the operation of each of the three digesters by a comparison of the pulps produced under similar conditions. The pulp received from the co-operating mill was subjected to the identical chemical and physical tests; the results of the comparison of mill- and laboratory-produced pulps are presented in tabular and graphical form. The most important conclusions are as follows: Under similar conditions of raw materials, alkali, temperature, pressure, and time, the rate of cooking in the laboratory digesters is the same as in the larger mill equipment; this is substantiated by the similarity of chemical tests on pulps from both sources. However, physical properties of the laboratory pulps are substantially higher than those of the mill pulp; this would indicate that the present commercial digesters do not produce for easy-bleaching pulps the strength values that can be produced from the wood. The small deviations from the mean values of the tests made on the cooks from the three experimental digesters shows their similarity in design and operation. For pulps of approximately the same original lignin content, the comparison of samples bleached by the sodium chlorite method does not appear to offer any advantage over a similar comparison of unbleached samples. 2 tables and 4 figures. E.S.

LESPEDEZA SERICEA

ANON. Sericea for paper pulp proved, says technologist. Southern Pulp Paper Manuf. 14, no. 9: 34 (September, 1951); *cf.* B.I.P.C. 20: 869.

Reference is made to the experimental work with *Lespedeza sericea* as a papermaking raw material in progress at the Department of Chemical Engineering of the University of Arkansas; not only paper, but also wallboard, insulating material, rayon, cellulose nitrate, and cellulose acetate can be made from the stalks. The information gained by the university will not be patented, but will become public property. The development work has almost reached the stage where the processes will be turned over to industry (see also Chem. Eng. 58, no. 1: 258-9 [January, 1951]). 2 illustrations. E.S.

LIGNIN

BENHAM, G. HARVEY. Lignin. Frontier 14, no. 3: 4-6, 20 (September, 1951).

Following a brief review of the chemistry of lignin and its properties, some of the investigations currently under way, including studies of nitrated and sulfonated derivatives, decomposition products formed by lignin-destroying organisms, and biogenetic origins of lignin, are mentioned. 14 references. M.W.

STONE, J. E., BLUNDELL, M. J., and TANNER, K. G. The formation of lignin in wheat plants. Can. J. Chem. 29, no. 9: 734-45 (September, 1951).

Wheat plants were harvested approximately every two weeks after emergence from the soil. Determination of the lignin content by the 72% sulfuric acid method showed a rapid increase between the period of 45-70 days from seeding, and there was a corresponding increase in the yield of vanillin and syringaldehyde, obtained by alkaline nitrobenzene oxidation. The *p*-hydroxybenzaldehyde yield remained low at all times and seemed to be derived from a different system. It is suggested that the source of this aldehyde is not the lignin, but the tyrosine associated with the protein. The ratios of vanillin to syringaldehyde did not remain constant from plants of different ages; the percentage of syringaldehyde was lower than that of vanillin in the young plants and higher in those which were more mature. This is qualitatively in agreement with an increase in the methoxyl content of the lignin. When the yield of aldehydes from mature plants is taken as the criterion for the amount of lignin present, the youngest plants have a lignin content of about 0.13%, a value much lower than other bases for calculation would indicate. Oxidation of the whole plant and of the plant which had been extracted with alcohol-benzene, water, and 1% hydrochloric acid, gave similar percentages of aldehydes, owing partly to the removal of aldehyde-producing substances and partly to the degradation of the lignin during the extraction process. Oxidation of the extracts gave no trace of aldehyde in the hydrochloric acid extract, a trace in the water extract, and appreciable percentages in the alcohol-benzene extract. This latter extract consisted of two portions, a red water-soluble, alcohol-benzene insoluble fraction and the main alcohol-benzene soluble fraction. The former gave rise to vanillin and *p*-hydrobenzaldehyde on oxidation; the amount was a maximum at the first harvest and decreased to zero after lignification had occurred. The alcohol-benzene soluble extract gave rise to syringaldehyde as well as the others; the amounts were low at first and increased during lignification in the same way as the main body of the plant. It is believed that the alcohol-benzene removes a soluble portion of the lignin since the relative proportions of the aldehydes are very similar to those obtained from lignin itself. 1 table, 8 figures, and 13 references. E.S.

MACHINERY

BELOIT IRON WORKS. Beloit engineering progress. Paper Mill News 74, no. 37: 46, 120 (Sept. 15, 1951).

The following recent developments in papermaking are described briefly: Beloit suction rolls, the Beloit air-cushioned controlled-flow inlet, the Beloit air guide, air diaphragm loading, and the Beloit differential drive. 1 illustration. M.W.

DOWNINGTOWN MANUFACTURING COMPANY. Downingtown developments. Paper Mill News 74, no. 38: 14-15 (Sept. 22, 1951).

Cutters, load meters, antideflection rolls, pulpers, and a stock cleaner which have recently been introduced by Downingtown are described. 8 figures.
M.W.

HODGE, E. A., JACKSON, P. ANDREW, and GOLDSMITH, P. H. Paper machine developments. Pulp and Paper Manual of Canada 19: 39, 41, 43, 45, 47 (1951).

To illustrate the methods by which papermakers and paper machine builders evolve successful improvements in the paper machine, several examples are given of developments which have been made, e.g., the Flow-spreader, the stream-flow vat and cylinder mold, drier part developments (Vitalizer), and others. 4 figures. M.W.

LEONARD, JACKSON D. What does maintenance cost? Chem. Eng. 58, no. 9: 149-53 (September, 1951).

Maintenance cost data are given for the following types of process equipment: filters, crushers and grinders, pumps, tanks, centrifugals, driers, evaporators, furnaces and kilns, crystallizers, conveyors, distillation columns, heat exchangers, dust and mist collection equipment, screens, sifters and mixers, clarification equipment, piping, and instruments. 4 tables. M.W.

MACHINERY—BEATERS

THE HURLBUT PAPER CO., *South Lee, Mass.* New combination rag washer and beater at Hurlbut. Paper Trade J. 133, no. 10: 94 (Sept. 7, 1951).

A washer-beater unit for the treatment of rags, which was built by E. D. Jones & Sons Co., has the following features: an all stainless-steel cylinder washer with separate electric drive and hydraulic raising and lowering mechanism, Taylor automatic roll control, and flushing devices for quick, easy dumping. 2 illustrations. M.W.

MACHINERY—BLOWERS

WAGNER, FELIX V. The application of turboblowers to paper machines. Das Papier 5, no. 15/16: 325-9 (August, 1951). [In German] *cf.* B.I.P.C. 18: 524.

The article deals with the advantages of Sulzer "Turbair" blowers and is very similar in scope to the previous reference. 1 table and 4 figures.
E.S.

MACHINERY—CENTRIFUGAL SCREENS

KRANCHER, CARL G. A new method of cleaning straw pulp. Tappi 34, no. 9: 133A; discussion: 133-4A (September, 1951).

The mode of operation of the Hydraclone and its application to the cleaning of straw pulp just prior to its entrance into the cylinder vat of a board machine are outlined. E.S.

MACHINERY—CONVERTING MACHINERY

NEW JERSEY MACHINE CORP., *Hoboken, N.J.* New machine labels rigid packages at high speed. Am. Boxmaker 40, no. 9: 20 (September, 1951).

A new labeling-machine application for the addressing and other imprinting of rigid boxes mechanically labels a box by taking the label from the fanfold supply and automatically affixing it to any desired side of the box at the rate of 3000 pieces per hour. The machine, called the Pony, permits speedy imprinting while providing rigid protection of contents, and is now employed by various organizations which make repeat mailings to a definite subscriber list. 2 illustrations. M.W.

MACHINERY—CUTTERS

ANON. Operation with circular cutters. Allg. Papier-Rundschau no. 13: 549-53 (July 12, 1951). [In German]

Recent German high-speed constructions of circular cutters, as well as combinations with scoring machines, are discussed. 17 figures. E.S.

HOLT, GEORGE A. Cutter-layboy units; they influence costs and quality. Pulp & Paper 25, no. 10: 60, 62, 64 (September, 1951).

The author discusses improved rotary cutters which will run up to 700 ft./min., overlapping layboys, and double-powered backstands for handling the rolls to be cut; these installations present an excellent opportunity for substantial reductions in paper finishing-room costs. 5 illustrations. E.S.

RANKIN, M. L. Why cut straw? Tappi 34, no. 9: 122-3A; discussion: 123-4A (September, 1951).

The advantages of cutting straw prior to charging into digesters are cited, and a new cutter and bale breaker for straw built by Taylor-Stiles are described. E.S.

MACHINERY—DRIVE, ELECTRIC

BERGER, R. C. Wet end helper drive; uses on cylinder board machines. Pulp & Paper 25, no. 10: 66, 68, 70 (September, 1951).

Motors for driving individually the various sections of the wet end of cylinder board machines are commonly known as wet-end helper drives (I); prior to their use, the cylinder molds were driven by the common felt. Different arrangements and installations of (I) are discussed. They can be added to existing machines with many benefits, such as greater tonnage; the use of more open felts resulting in better water removal, increased machine speeds, and felt life; and lower steam costs at the driers. New developments, such as automatic control, will make (I) less subject to human variables. 6 figures. E.S.

MACHINERY—ELECTRIC EQUIPMENT

MORTENSON, A. O. Electrical Engineering Committee. Electric Cable Subcommittee. Tappi 34, no. 8: 74A, 76A, 78A, 80A, 82A, 84A; no. 9: 78A, 80A, 82A, 84A, 86A, 88A, 90A, 92A, 94A, 96A, 98A, 100A, 102A (August, September, 1951).

The minutes of the first and second meetings of the subcommittee are presented; they were devoted to a consideration of TAPPI project no. 369 "Application of electric cable in the paper industry." In the second discussion, a key sheet with the common causes of cable failure under normal operating conditions and the predominant location of such failures, as well as tabulated data on their occurrence in the sulfite, sulfate, groundwood, rag, and waste paper industries are included. E.S.

MACHINERY—FELTS

WOODSIDE, L. M. Conservation of paper machine felts. Part I. Design and construction. Paper Trade J. 133, no. 12: 26, 28 (Sept. 21, 1951); *cf.* B.I.P.C. 20: 405.

The factors which affect the proper design and conservation of felts are discussed briefly. M.W.

MACHINERY—GUIDE ROLLS

THE BLACK-CLAWSON COMPANY. Black-Clawson wire and felt guide. Paper Mill News 74, no. 37: 104 (Sept. 15, 1951).

A new air-operated wire and felt guide was developed primarily to provide effective control of the wire at speeds in the 3000-ft./min. range or higher. It is a dual control unit which includes a quick-acting air cylinder capable of relatively large instantaneous corrections of momentary duration, and a motor-operated, micrometer-screw adjusting unit which follows up with a very small retained correction. Air is obtained from a palm-actuated pilot valve located on each side of the machine. The mode of operation of the unit is described. 1 illustration. M.W.

MACHINERY—KNIVES

LARSON, E. T. Grinding and honing machine knives. Pulp and Paper Manual of Canada 19: 64-5, 67, 69, 72 (1951); Paper Trade J. 133, no. 16: 20, 22, 24, 26 (Oct. 19, 1951).

The various factors involved in the successful care of machine knives are discussed. 4 illustrations. M.W.

PULP & PAPER. Manufacture of chipper knives typical of service industry development. Pulp & Paper 25, no. 10: 100 (September, 1951).

A brief reference is made to processes involved in making chipper knives at the Heppenstall Co., Pittsburgh, and directions for chipping operations are given. The importance of sharp knives at all times is stressed. 3 illustrations. E.S.

MACHINERY—KOLLERMILL

HAUG, ANTON J. The Haug Kollermill. Pulp Paper Mag. Can. 52, no. 9: 100-2 (August, 1951); *cf.* B.I.P.C. 21: 96.

This is the same article as the one by Doyle presented in the previous reference. 5 illustrations. E.S.

MACHINERY—PACKAGING MACHINERY

LA CHOY FOOD PRODUCTS COMPANY, *Archbold, Ohio.* Plant tour: Chinese dinners; American production packaging . . . Packaging Parade 19, no. 224: 57-9 (September, 1951).

The packaging methods which are used in assembling dinner packages of canned Chinese food are described. After the separate ingredients have been packaged in their individual containers, they are packed in unsealed shipping cases which are placed on a turntable. The carton blanks are stacked on an adjoining turntable for assembly. In this way a supply of both cans and carton blanks is made available to the packer by turning the table to a full shipping case. 14 illustrations. M.W.

MACHINERY—PAPER MACHINE

ANON. Paper machine at Potlatch Forests, Inc. Paper Trade J. 133, no. 10: 162-4 (Sept. 7, 1951); *cf.* B.I.P.C. 21: 567.

Details of the Rice Barton Fourdrinier machine in the new Potlatch mill are given. 5 illustrations. E.S.

FINCH, PRUYN & COMPANY, INC. New paper machine for Finch Pruyn. Paper Trade J. 133, no. 10: 114, 116 (Sept. 7, 1951); *cf.* B.I.P.C. 21: 781-2.

A new 122-inch Pusey and Jones Fourdrinier and auxiliary equipment are described. 5 illustrations. M.W.

MACHINERY—PAPER MACHINE—DRAW REGULATION

SNIDER, EDWARD H. A frequency-type paper machine speed recorder. Pulp Paper Mag. Can. 52, no. 9: 107-8 (August, 1951); Paper Mill News 74, no. 42: 86, 90 (Oct. 20, 1951); *cf.* B.I.P.C. 21: 705.

A method for the continuous measurement and recording of paper-machine speed has been devised. It consists essentially of a small, self-excited, synchronous alternator which is geared to the drier lineshaft, and the frequency generated is measured with a standard recording frequency meter calibrated in ft./min. of machine speed. The sensitivity and accuracy of the instrument are satisfactory, and little maintenance is required. 3 figures. E.S.

SNIDER, EDWARD H. The significance and continuous measurement of draw speed. Pulp Paper Mag. Can. 52, no. 9: 109-12 (August, 1951); *cf.* B.I.P.C. 21: 705.

This is the same article as given in the previous reference. E.S.

MACHINERY—PIPING

GROVES, KEN D. Synthetic elastomer linings prove economical in kraft bleaching unit. Corrosion 7, no. 8: 1 (August, 1951).

After 20 months of service in carrying kraft stock (5% consistency) mixed with a calcium hypochlorite solution, a saran-lined fabricated steel pipe showed no sign of deterioration. The installation replaced a stainless-steel pipe which had a maximum service life of 12 to 14 months. The initial cost of the saran-lined pipe was 60 to 70% of the original stainless-steel installation, and with a projected service life of two years, the cost of the lined pipe would be less than 35% of the original material. The saran lining is easily applied in the field, and curing can be effected with a weak ammonia solution at relatively low temperatures. 2 figures. M.W.

MACHINERY—PRESSES

SUTHERST, T. Modern press assemblies incorporating suction pick-up. World's Paper Trade Rev. 136, no. 7: 461-8, 473-82 (Aug. 16, 1951).

The author discusses different press assemblies of paper machines designed for producing a variety of papers, which can be applied to old machines in need of modernization as well as to new machines. In the majority of these new press assemblies vacuum transfer from the wire to the couch is in-

corporated, so that wet-end breaks are greatly reduced. Different modifications of stacked, semistacked, and Simplex presses and their applications are described; in addition, felt cleaning, rubber covering, the avoidance of shadow marking by felts and filling up of the drilled holes in the rubber-covered bronze shell, various arrangements of suction pickup rolls and their operation, and power consumption of the different equipments are given consideration. 1 table, 30 figures, and 4 references. E.S.

MACHINERY—PULPERS

MORDEN, BURKE. Description and action of the Morden "Slush-maker" pulper. Tappi 34, no. 9: 400-3 (September, 1951); *cf.* B.I.P.C. 21: 559.

The "Slush-maker" pulper quickly and efficiently gives the initial disintegration to pulp or paper stock. In addition, through a handwheel-controlled, bar-to-bar setting, difficult flakes and bundles are readily brushed out of the stock, color and other additives mixed and brushed in, furnishes blended and, if desired, given a preliminary beating treatment, either on a continuous or batch basis. Tests run with the pilot machine show that the "Slush-maker" completely defibers high wet-strength papers, even in cold water, without damaging the fiber. 5 figures. E.S.

MACHINERY—REFINERS

EBERHARDT, L. E. Disk mill refining of strawboard pulps. Tappi 34, no. 9: 131A; discussion: 131-2A (September, 1951).

Preliminary data on the use of single- and double-disk refiners with Hydrapulper-cooked straw and a modification of the Celdecor process are given. E.S.

HERMAN, L. F. Results with turbo pulp refining. Tappi 34, no. 9: 132A; discussion: 132-3A (September, 1951).

The mode of operation of turbo refiners and results with Hydrapulper-cooked straw and Chemipulper oak mixtures are discussed. E.S.

MACHINERY—SAWS

ANON. Band saw is used by Hoberg Paper Mills to speed production of packaged towels. Am. Paper Converter 25, no. 7: 14 (July, 1951).

Evergreen-brand Hoberg towels come in slabs folded and wrapped in the final cover from the converting department; they are then cut into three packages on a 36-inch Delta-Crescent blade saw. The operation of the saw is outlined. It runs two shifts to maintain a balanced production. In seven years of service no other maintenance than blade sharpening has been necessary. 3 illustrations. E.S.

POND, T. M. Report on power saw tests. Pulp and Paper Manual of Canada 19: 19, 31 (1951); *cf.* B.I.P.C. 21: 23.

A survey conducted by the Cutting Tools Committee among member companies of the Canadian Pulp and Paper Association during 1949-50 indicated an increase in production through the use of power saws of 20% per man-day. This means an increase in daily gross earnings of 46 cents. It was also found that most successful results in increased production have been obtained where power saws are owned by the workers. M.W.

MACHINERY—SCREENS

FAHLGREN, SVEN. Review of application of the Jonsson screen. Tappi 34, no. 9: 129-30A; discussion: 130-1A (September, 1951); *cf.* B.I.P.C. 19: 326.

The advantages and applications of Jonsson vibrating screens to groundwood, chemical, Asplund, waste-paper, and straw stocks are discussed. E.S.

WARREN, B. D. How to keep your vibrating screens at peak efficiency. Paper Trade J. 133, no. 11: 19-20 (Sept. 14, 1951).

The Bird Machine Co. suggests the following practices for the use and maintenance of Bird Jonsson screens: the vat should be filled with stock or water before starting up or shutting down; stock should be fed to the screen at a uniform consistency; the screen plates should be cleaned with steam when required; and the bearings should be properly lubricated. 1 illustration. M.W.

MACHINERY—SLITTERS AND WINDERS

HUDSON SHARP MACHINE CO. Hudson Sharp continuous operating toilet winder. Paper Trade J. 133, no. 10: 104 (Sept. 7, 1951); Southern Pulp Paper Manuf. 14, no. 10: 182 (Oct. 1, 1951); Am. Paper Converter 25, no. 10: 16, 18 (October, 1951).

New winders have been developed which operate continuously at a constant speed and which deliver uniform-count rolls without stops, other than a change of the parent rolls. Each shaft of completed rolls is carried through seven stations during the winding process, and ten winding shafts are used to complete each cycle. The output of machines which have already been installed is well over the normal production of the machines which they have replaced. 1 illustration. M.W.

MACHINERY—VATS

HOLLIS, R. FRANK. Stock formation on cylinders; what is the mechanism of it? Pulp & Paper 25, no. 10: 36-8, 104, 106 (September, 1951).

The author outlines a discussion on the operation of the cylinder board machine in the form of a questionnaire on types of vats; size of molds; contour of vat linings; white water ports; type, size, and spacing of mold bars; types and mesh of cylinder-cover wires; bottom felts; mold-spindle booster motors; vat temperatures; stock characteristics *vs.* formation; vat white-water systems; and mold end seals. Although written in the form of questions, important information is given through this medium. Replies and comments on the points raised are invited. 7 illustrations. E.S.

MACHINERY—WAXING MACHINE

HOLLINGSWORTH & WHITNEY CO., *Waterville, Me.* Modernization at Hollingsworth & Whitney waxing division. Paper Trade J. 133, no. 10: 126, 128 (Sept. 7, 1951).

A modern high-speed waxing machine, constructed by the Dilts Machine Works, is capable of wet waxing at 1500 ft./min. and dry waxing at 2000 ft./min. The machine may also be used as a laminator for many dissimilar types of materials. 1 illustration. M.W.

MATERIALS HANDLING

BEUTER, EDMUND F. Unitizing for profit. Am. Paper Merchant

48, no. 9: 26-7, 66-7 (September, 1951); *cf.* B.I.P.C. 22: 25.

The construction of unit loads which are built on a sheet of light board and handled with wide-blade, chisel-pointed forks is described, and a discussion is presented of some of the techniques employed and the problems encountered in the unitizing program of the Zellerbach Paper Company. 4 figures. M.W.

FITZPATRICK, L. L. Mechanical charging of Hydrapulpers. Pulp Paper Mag. Can. 52, no. 9: 95-9 (August, 1951); *cf.* B.I.P.C. 19: 405.

Following a brief description of the three types of Hydrapulpers made (the batch, the continuous or waste-paper, and the broke unit), methods for the mechanical charging of each type are discussed. Their selection will depend upon the conditions of the installation, the type of furnish, and the location of the mill storage. For batch units, fork trucks, open or swinging box-type loaders, endless belt conveyors, and pallet operation with tilting or stationary platforms are used, whereas endless belts, open box-type loaders, and fork trucks are first, second, and third choices for the continuous Hydrapulper. In the case of broke handling, the pulper is usually located under the machine producing the broke which is dumped directly or fed by means of conveyors. 9 figures. E.S.

PORTHAN, ILMARI. Materials handling at the plant. Paper and Timber (Finland) 33, no. 7: 241-5; no. 8: 264-6 (July, August, 1951). [In Finnish; English summary]

The transport and handling of goods are closely related to the extent that all materials handling can be considered transportation and vice versa; in the United States materials-handling costs are considered to amount to 25 to 50% of the market price. The correct organization of materials handling and the selection of suitable equipment for a plant are discussed. The expenses incurred in this operation are often difficult to estimate, because they are frequently involved with and covered by other expenses; however, it is important that accurate information concerning their magnitude be obtained. 8 figures. E.S.

YORK, A. E. Shovel-crane maintenance today and everyday. Southern Pulp Paper Manuf. 14, no. 9: 58 (September, 1951).

Directions for the proper care, operation, lubrication, inspection, and overhaul of power cranes and shovels are given. Systematic maintenance can usually be developed by following carefully the manufacturer's instruction manuals. E.S.

MATERIALS OF CONSTRUCTION

HESSE, L. W. What is today's steel situation? Tappi 34, no. 9: 135-6A (September, 1951).

Data on the current expansion in the American steel industry are given. E.S.

WEST, JAMES R., *and others.* Sulphur vs. construction materials. Chem. Eng. 58, no. 9: 276, 278, 280-4, 286-8, 290 (September, 1951); *cf.* B.I.P.C. 17: 117-18.

At present, cast iron and steel predominate in the transportation of molten sulfur for industrial usage. Although they are resistant to attack by sulfur under ideal conditions of moisture, aeration, and temperature, the chief rea-

son for their use is their relatively low cost. Corrosion data on other materials which might provide more resistance to corrosion by sulfur at high temperatures is presented. Information is included for the following metals: aluminum, cast iron and carbon steel, silver and silver alloys, cadmium, lead, manganese, chromium, magnesium, ceramics and fused silica, copper and copper alloys, nickel and its alloys, platinum, and stainless steels. Additional data on Worthite, Chlorimets, carbon and graphite, cements, coatings, Durimet 20, high-silicon irons, glass lining, rubber, silicones, and tantalum are appended. 1 illustration. M.W.

METERS AND RECORDERS

CUSICK, C. F., and ROSS, S. D. Measuring liquid level in vessels under pressure. Pulp and Paper Manual of Canada 19: 73, 75, 77, 79, 81, 83, 86 (1951).

Following a discussion of the fundamental principles of both electrical- and mechanical-type meter bodies, some specific applications are described and illustrated. 8 figures. M.W.

MCARN, T. A. Load meter measures nip pressure. Pulp and Paper Manual of Canada 19: 59, 61 (1951); *cf.* B.I.P.C. 21: 783.

The Downingtown direct roll load recorder and controller, which utilizes the Baldwin SR-4 load cell as its sensitive element, is described. 3 figures. M.W.

STATIMETER CORPORATION OF AMERICA, *Cleveland.* The Statimeter. Pulp and Paper Manual of Canada 19: 86-7 (1951).

The Statimeter, an instrument for measuring and indicating mechanical forces, is based on the practical incompressibility of liquids. It consists of an annular ring of rubber filled with a deaerated mixture of glycerin and water to which a Bourdon-type pressure gage is connected. Pressure exerted on the casings is instantly transmitted to the gage and indicated on the dial. The instrument is unique in that loads can be measured with practically no movement, and the coefficient of friction is eliminated. Its calibration is standard, and it can be used as a laboratory instrument. It can also be used to measure applied forces on calenders and press rolls, for controlling hydraulic presses, and in tensile-testing machines. 2 figures. M.W.

MILL MANAGEMENT

RICHMOND, H. R. "Shorter work week." Pulp Paper Mag. Can. 52, no. 9: 84-6 (August, 1951).

A work schedule which has been successfully employed by a British Columbia pulp company is described. Based on a seven-day work week, the schedule provides a 40-hour week for day workers and a practical compromise of a 42-hour week for tour workers. This system has proved to be more satisfactory than the former 44-hour week to management as well as the workers because it allows better organization of work at no additional cost to the company. 2 tables. M.W.

PACKAGING

ANON. Paper containers for frozen foods. Paper Container 65, no. 2: 37-8; no. 3: 63, 65 (August, September, 1951).

The techniques and materials which are employed in the packaging of frozen foods are discussed, and it is pointed out that specially made, wax-

impregnated paper containers with an inner bag of rubber or cellulose film and a heat-sealed outer wrapper of the same material offer the best protection against dehydration and oxidation. M.W.

COMMERCIAL SOLVENTS CORPORATION. *Pharmaceuticals.* Antibiotic tester. Modern Packaging 25, no. 1: 109 (September, 1951).

A convenient multiple package for antibiotic tablets is described. The package consists of a large paperboard carrier box into which fit 12 individual setup boxes. The setup boxes contain 24 of the "Dia-Discs" diagnostic tablets which are unit packaged in Pliofilm. Paper labels on the boxes are printed with easily identifiable code numbers and provide a protective seal. 1 illustration. M.W.

DERBY, THOMAS H. Meat-wrapping technique. Modern Packaging 25, no. 1: 122-3, 174, 177 (September, 1951).

A series of experiments was carried out to determine the most effective method of preventing discoloration of ground beef and ground round steak which is prepackaged for self-service retailing. Since discoloration results from a deficiency of oxygen in the surrounding atmosphere, it is necessary to employ wrapping techniques which incorporate a supply of oxygen in the package and permit air to permeate the wrapper. It was found that both types of meat could be maintained with a salable appearance for as long as 48 hours when they were loosely packed and loosely wrapped with a film which has the characteristics of Sylvania MSBO. The gage of the film had no effect on color retention, but moistureproof qualities were necessary to prevent dehydration and resultant darkened color. 1 table and 1 figure. M.W.

FOOD ENGINEERING. Armour's prefab meats tap new market. Food Eng. 23, no. 9: 80-2 (September, 1951).

Armour and Co. has pioneered in the field of prepackaged frozen meat and now has a total of 40 fresh-frosted items on the market. The very favorable consumer response to prepackaged meats is largely the result of the development of the "Flex-Vac" vacuum packaging concept (*cf.* B.I.P.C. 21: 328) which eliminates the shelf-life problem through the use of heat-sealed, vacuumized, transparent flexible pouches of cellophane or laminated Pliofilm. 6 illustrations. M.W.

GRUNDY, ALBERT V., and RUBINATE, FRANK. Military packaging. Food Eng. 23, no. 9: 111-14, 176 (September, 1951).

A summary of the chief properties required in containers to meet supply-line conditions, representative accomplishments of the container laboratories in fulfilling these requirements, and some of the packaging problems which have not yet been solved is presented. 3 tables and 1 illustration. M.W.

NATIONAL DAIRY PRODUCTS CORPORATION. Color for dairy goods. Modern Packaging 25, no. 1: 82-4, 178 (September, 1951).

Sealtest-brand dairy products are now packaged in uniformly designed, color-keyed cartons. The effect of broad areas of color was achieved by using a "tile" or cross-hatched design which also allows sufficient open area in the cross-hatch lines for wax penetration to give adequate protection to the products. A package color code is used for each type of product and provides for easy identification and selection. Containers for specialty products also incorporate the basic tile design but are characterized by distinctive arrangement and lettering. 8 illustrations. M.W.

XLNT SPANISH FOODS CO., *Los Angeles.* Pan packaged. Modern Packaging 25, no. 1: 96-7 (September, 1951).

The use of aluminum foil trays for packaging enchiladas provides a container in which the product can be heated and served from directly. The nonabsorptive feature of the package keeps the product fresh and flavorful for an appreciably longer time than was possible in the paperboard containers formerly used. Product identification is achieved on a heat-sealed printed cellophane overwrap, and consumer acceptance of the packaging technique is reflected in the 100% sales increase since the adoption of the foil trays. 5 illustrations. M.W.

PAPER—COATED (HOT-MELT)

BURGESS, L. M. Saran-coated paper. Modern Plastics 25, no. 1: 117-21 (September, 1951).

The application of saran directly to paper by a hot-melt process is described. The resin has a relatively short thermal life and is quickly heated to the molten state, applied to preheated paper, metered to the desired thickness by a knife-coating technique, and crystallized in a hot air oven. Under the proper conditions, paper which is hot-melt coated with saran has properties similar to those of the extruded, oriented, free film. It can be readily heat-sealed, has a gas-transmission rate comparable with that of the film, and is easier to fabricate. In comparison with other plastic-coated papers, it has been found to be superior to polyethylene-coated paper in its impedance to water vapor and gases and in its resistance to grease and solvents. It is comparable to polyethylene in its resistance to acids and heat sealability, is slightly inferior in alkali resistance, and quite inferior in low-temperature flexibility. 1 table, 11 figures, and 4 references. M.W.

PAPER—MERCHANDISING

AMERICAN PAPER MERCHANT. Inlander-Steindler Paper Co. Am. Paper Merchant 48, no. 8: 12-13, 50-1; no. 9: 20-1, 60-1 (August, September, 1951).

A description is given of the Inlander-Steindler Paper Co. of Chicago, one of the leading wrapping paper firms in the midwest. A thorough sales training program, warehouse palletizing with a wide use of materials-handling equipment, and close co-operation with sources of supply are among the company policies which are emphasized. 3 illustrations. M.W.

PAPER AND PULP INDUSTRY

ALLEY, HAROLD R. Japanese paper industry. Paper Ind. 33, no. 6: 663-7 (September, 1951).

The author describes his observations in 15 paper mills and one paper coating plant, including notes on conferences with Japanese industrialists, government officials, jobbers, etc. Handmade paper, converted paper products, and specialty papers are also discussed briefly. Statistical data on Japanese paper and pulp production for 1930 to 1948 are included. 2 tables, 1 map, and 5 illustrations. E.S.

BETTENDORF, HARRY J., and HELME, ROY V., JR. Wood pulp and pulpwood statistics. Fibre Containers 36, no. 8: 130, 132-8 (August, 1951); *cf.* B.I.P.C. 21: 28.

Pulpwood receipts in 1949 and 1950 lagged behind the manufacture of pulp

in all areas except the South. Although there was a record production of pulp, paper, and board in 1950, the manufacture of end products was increased at the expense of reductions in pulpwood and pulp inventories. The three principal reasons for this situation were lower imports of European pulp, greater production of kraft liners and corrugating mediums and other items from virgin pulp, and insufficient new sources of wood supplies on the North American continent. Future increased supplies of pulp will have to come from improved silviculture and high-yield pulping methods; a greater use of waste paper would also ease the situation. Present stands of wood must be maintained on a sustained- or increased-yield basis if the industry is to have the necessary continued supply of wood in the future. Present increases in capacity have been occurring in the Southern, Lake, and Pacific areas in the sulfate and semichemical types of pulping; the accompanying increases in sulfite, groundwood, and soda were relatively small. Numerous tables, diagrams, and charts. E.S.

BOARD OF TRADE JOURNAL. Paper and board production in 1950. World's Paper Trade Rev. 136, no. 1: 4, 6, 8 (July 5, 1951).

Statistical information for the British paper and board industry in 1950 is given. The total production amounted to 2,614,000 tons, of which newsprint accounted for 544,000, all other paper 1,329,000, and boards 741,000 tons; all figures are above those of the preceding year, but newsprint amounts to only two thirds of the prewar figure. The high level of paper and board production in 1950 was achieved only at the expense of a considerable reduction in wood-pulp stocks and by means of increased waste-paper consumption, also drawn from stock. The rise in esparto prices during the year led to a reduction in esparto consumption. 7 tables. E.S.

CATLEEN, H. A new export survey of the world. Brit. Packer 13, no. 8: 25-6 (August, 1951).

A survey chart of the total amounts of British individual exports in 89 countries for the years 1949 and 1950 is presented, with a gradation of marketing possibilities and import difficulties. 1 table. M.W.

GEPP, HERBERT W. Pulp, paper and paperboard industry of Australia. Pulp Paper Mag. Can. 52, no. 9: 72-83 (August, 1951).

Following a brief report of the history and economic development of Australia, the history of the Australian pulp and paper industry is reviewed, and a semitechnical description of the various mills and their products is given. In conclusion, research developments (e.g., high-alpha content pulps for the manufacture of propellants and dissolving pulps from eucalypt), and research facilities are discussed. 9 illustrations, 1 map, and 18 references. M.W.

PARKER, COLA G. The history and work of the Import Committee of the American Paper Industry. 11 p. (1951).

The conditions which led to its organization and the activities of the Import Committee through 27 years are reviewed. M.W.

PERRY, HENRY J. Expansion '51 '53? Paper Trade J. 133, no. 10: 134, 136 (Sept. 7, 1951).

Future expansion in the paper industry, which has been granted Certificates of Necessity amounting to $425 million, will depend on the availability of paper machinery. Manufacturers of paper machinery are near the bottom

of the government allocation list, and, unless authorities are informed of the critical situation in this industry, the expansion necessary to maintain an increasing production of paper will not be realized. 1 figure and 1 map.
M.W.

ROE, R. D. British pulp and paper imports from Canada greatly reduced. Pulp Paper Mag. Can. 52, no. 9: 158, 160 (August, 1951).

Statistics are presented for British imports of dry bleached and unbleached wood pulp, wet mechanical wood pulp, and newsprint. In all cases, the 1950 imports from Canada dropped sharply from those of 1949. Owing to the exchange situation, total Canadian pulp shipments to England totaled only 94,785 tons, as compared with 166,821 tons in 1949. It is anticipated, however, that 1951 Canadian pulp exports to this market will exceed the 1949 total by about 10%. 4 tables. M.W.

SHEPARD, H. B. Plant modernization, new and specialized products, strengthen area's paper industry. Paper & Paper Products 92, no. 24: 10, 22-4, 29 (Sept. 5, 1951).

Following a brief historical introduction, the author describes the development of the pulp and paper industry in New England and the reasons why it has not shared proportionately in the growth of the industry during the second quarter of the 20th century. However, New England still produces large proportions of the nation's supply of the higher and more specialized grades. The natural advantages and disadvantages of New England mills, the need for modernization, and the raw-materials problem (including the utilization of hardwoods, the semichemical pulping process, and improved forestry conditions and activities) are discussed as they apply to the industry's prospects for continued successful operation. 3 block diagrams. E.S.

U. K. COMMERCIAL COUNCELLOR, *Berne*. The Swiss paper market. Paper Market: 40-2 (August, 1951); World's Paper Trade Rev. 136, no. 7: 439-40, 442, 444 (Aug. 16, 1951).

A detailed report on the paper market in Switzerland indicates that the present position of the market for British manufacturers is, at least temporarily, favorable. There are good opportunities for manufacturers of the better-quality papers if prompt delivery can be promised and if prices are competitive with those of continental suppliers. 1 table. M.W.

PAPER AND PULP INDUSTRY—EDUCATION

WESTBERG, J. E. Education activities in the paper and pulp industry. Paper and Timber (Finland) 33, no. 8: 251-3 (August, 1951). [In Swedish; English summary]

Svenska Cellulosa Aktiebolaget has organized an extensive educational program among its mill workers. All activities are carried out during working hours; the program is based on a book prepared for this purpose and several motion pictures. All old and new workers are participating. The purpose is the creation of interest in the job and production; the demand for a higher-quality product also calls for an increased knowledge among workers. In the mills where the educational program has started, each worker has already attended 10 lectures on the chemical pulping processes, which will be followed by another 10 lectures devoted to special studies in the different sections of the mill (digester house, screening room, bleach plant, machine room, and boiler house). The experience from these activities has

thus far been very satisfactory. The workers have participated with great interest, and it is hoped that lasting benefits in industrial relations will be realized. 1 illustration. E.S.

PAPER AND PULP MILLS

ANON. Alaska mill assured; first pulp to be made by 1953. Pulp & Paper 25, no. 10: 46, 48, 50 (September, 1951).

Ketchikan Pulp & Paper Co., of Bellingham, Wash. will construct a pulp mill, bleach plant, and chemical and heat recovery unit at Ward's Cove, six miles northeast of Ketchikan, Alaska, to make 300 tons daily of high-alpha cellulose by 1953. Puget Sound Pulp & Timber Co. of Bellingham and American Viscose Corp. of Philadelphia, the principal equal owners of Ketchikan Pulp & Paper Co., will convert most of the pulp to rayon, cellophane, and other products. Details of the 40-million dollar project, including the provisions of the timber deal, are given; the construction of the plants will begin late in 1951 or early in 1952. 2 maps. E.S.

ANON. Tervakoski new paper machine. Paper and Timber (Finland) 33, no. 8: 253 (August, 1951); World's Paper Trade Rev. 136, no. 10: 668 (Sept. 6, 1951). [In English]

The Tervakoski paper mill was founded in 1818 and is the oldest paper mill in Finland which is still in operation; it specializes in thin papers (condenser tissue and carbon and cigarette papers). During recent years an extensive modernization program has been carried out; one new paper machine was installed three years ago, and another new machine (both constructed in Finland) started operations in May, 1951. Two of the mill's oldest machines (delivered by Donkin and Bermondsey in 1851 and during the 1860's, respectively) were still operating last summer. These two machines have been revamped and reassembled in the mill's workshop into one new machine which was also placed in operation in May, 1951. 1 illustration in the first reference. E.S.

HUDSON PULP & PAPER CORPORATION. Expansion at Hudson Pulp and Paper Corp., Southern Division, Palatka, Fla. Paper Trade J. 133, no. 10: 137-8 (Sept. 7, 1951).

Both the pulp and paper mill facilities at the Palatka mill are being doubled, and mill output capacity will total 400 tons daily of finished unbleached kraft bag and wrapping papers. A separate unit will be provided for the preparation of lightweight papers. Plans include an enlargement of woodyard and woodroom facilities, five new digesters, a new blowtank, and a new Pusey & Jones 234-inch special Fourdrinier MF and MG kraft machine. 5 illustrations. M.W.

KIMBERLY-CLARK CORPORATION OF CANADA, LTD. K.C. of Canada expansion. Pulp Paper Mag. Can. 52, no. 9: 87-8 (August, 1951).

The installation of its second creped wadding machine has been announced by Kimberly-Clark at Kapuskasing, Ont. The machine, which is rated at 30 tons daily capacity, is designed to operate at 2000 or more ft./min. and will use a mixture of bleached sulfite and sulfate pulps. The additional wadding capacity in Canada should have a marked influence on the availability of the end products both in Canada and the United States. 3 illustrations. M.W.

MCGINN, E. P. Charleston improvements. Paper Trade J. 133, no. 10: 84, 86, 88-92, 94 (Sept. 7, 1951).

The equipment and recent improvements at the Charleston mill of the West Virginia Pulp and Paper Co. are described. 31 illustrations. M.W.

MCGINN, E. P. Covington modernizes. Paper Trade J. 133, no. 10: 62, 66, 68, 71-2, 74, 76, 78-80 (Sept. 7, 1951); *cf.* B.I.P.C. 21: 792.

A detailed description of recent alterations and improvements at the Covington, Va. mill of the West Virginia Pulp and Paper Co. is presented. 33 illustrations. M.W.

MCGINN, E. P. Crossett expansion. Paper Trade J. 133, no. 10: 144-52 (Sept. 7, 1951).

One of the improvements scheduled at the Crossett Paper Mills is the installation of debarking equipment in the lumber mill (Crossett Lumber Co.) so that slabs, edgings, and other wood waste can be chipped and used for pulp manufacture. Other recent improvements in the pulp and paper mills are also described. 29 illustrations. M.W.

MCGINN, E. P. Expansion at Lee Paper Co. Paper Trade J. 133, no. 10: 139-43 (Sept. 7, 1951).

A new (third) paper machine which is designed and built especially for the production of rag and sulfite high-grade, printing, and specialty papers and auxiliary equipment have recently been put in operation. 17 illustrations. M.W.

MCGINN, E. P. Thilmany expands. Paper Trade J. 133, no. 10: 128, 130-3 (Sept. 7, 1951).

Among the improvements being carried out at the Thilmany Pulp and Paper Co. are the remodeling of the wood-handling system, the lining of digesters with Inconel (*cf.* B.I.P.C. 21: 462), the installation of a new vacuum washing system, and the construction of a new recovery furnace. 14 illustrations. M.W.

MORGANTI, LINO. Fine paper from bagasse; details of new Brazilian enterprise. World's Paper Trade Rev. 136, no. 5: 292, 294, 296 (Aug. 2, 1951).

Reference is made to the construction of a fine paper mill in Monte Alegre, Brazil, which will use the Pomilio process for the manufacture of bagasse, eucalyptus, and rag pulps at first for the distribution to local mills until the papermaking machinery is installed. Celdecor Development Corp. is responsible for the planning and erection of the mill; construction began in December, 1950, and it is hoped that operations will start in 1952. E.S.

NORTHERN PAPER MILLS. 50 years of progress. Paper Trade J. 133, no. 10: 152-4 (Sept. 7, 1951).

The history and growth of Northern Paper Mills, Green Bay, Wis., during the past 50 years is briefly reviewed. 4 illustrations. M.W.

PAPER TRADE JOURNAL. The Camas story, August 1, 1950 to August 1, 1951. Paper Trade J. 133, no. 10: 106, 108, 110 (Sept. 7, 1951); *cf.* B.I.P.C. 21: 884.

A description of the wood preparation and papermaking equipment of the Crown Zellerbach mill at Camas, Wash. is presented. 1 illustration. M.W.

PORTER, RICHARD W. Potlatch brings new industry to the Inland Empire. Paper Ind. 33, no. 6: 650-9 (September, 1951); *cf.* B.I.P.C. 21: 567.

A detailed description of the 150-ton bleached kraft pulp and paper mill of Potlatch Forests Inc. at Lewiston, Idaho is given. 36 illustrations. E.S.

POWELL RIVER COMPANY. Powell River development program at half way mark. Paper Trade J. 133, no. 10: 157-8 (Sept. 7, 1951); Paper Ind. 33, no. 6: 632 (September, 1951); Pulp Paper Mag. Can. 52, no. 10: 170 (September, 1951); Can. Pulp Paper Ind. 4, no. 9: 24, 26; no. 10: 21 (September, October, 1951).

In spite of shortages and curtailments of materials, the development program, which will result in the production of an additional 130 tons of newsprint daily, should be completed by the middle of 1952. 3 illustrations in the first references and 9 in the last one. M.W.

PRATT, RALPH C. Hoberg Paper Mills. Paper Trade J. 133, no. 10: 154-7 (Sept. 7, 1951).

The mill equipment of the Hoberg Paper Mills, Green Bay, Wis., is described. 9 illustrations. M.W.

PULP & PAPER. New ideas at "Kap," also a new wadding machine. Pulp & Paper 25, no. 10: 79-80 (September, 1951).

Improvements to the Kimberly-Clark crepe wadding and tissue mill in Kapuskasing, Ont. include a second creped wadding machine to double the mill's output; its associate, Spruce Falls Power & Paper Co., will increase newsprint production by 12,000 tons a year by rebuilding the three paper machines and modernizing the entire mill. Present installations are described briefly. 7 illustrations of the town and mill equipment. E.S.

PULP & PAPER. North Carolina mill 5-year improvement program. Pulp & Paper 25, no. 10: 82, 84 (September, 1951).

Reference is made to the broad improvement program of the Halifax Paper Co. at Roanoke Rapids, N.C. which is associated with Albemarle Paper Mfg. Co. of Richmond, Va. Beginning with a woodyard expansion in 1946 and 1947, the improvements included a new chipper, a rebuilt machine, a new Kamyr wet-lap machine, a new recovery unit, and various new washing and screening facilities. A new expansion program was begun in 1951 and is expected to be concluded by December, 1952; it involves the installation of a new Beloit 246-inch Fourdrinier machine, a new coal- or oil-fired boiler, and a high-density pulp tower. Halifax will average about 415 tons daily of sulfate pulp, of which it will convert a minor portion to kraft bag and wrapping paper; it will continue as an important pulp supplier to Albemarle. 7 illustrations. E.S.

RHINELANDER PAPER COMPANY. Rhinelander present expansion and modernization program. Paper Trade J. 133, no. 10: 101-2, 104 (Sept. 7, 1951).

Included in the expansion currently underway at Rhinelander is a new paper machine and a new 12,500-volt turboelectric generating installation.

The company has also ordered a triple-effect evaporator for the evaporation of spent sulfite liquor. 8 illustrations. M.W.

WILLIAMS, G. N. Mando modernization story. Paper Trade J. 133, no. 10: 159-62 (Sept. 7, 1951).

Minnesota and Ontario Paper Co.'s recent improvements include: the placing in commercial operation of a Mando-designed coating machine, the construction of a groundwood bleachery, and the installation of a new sulfite screening system, electrostatic precipitator, and coal-handling facilities at the International Falls, Minn. plant; the construction of a new woodroom and modernization of the screen room at the Fort Frances, Ont. plant; and the conversion of boiler facilities to lignite operation and replacement of the Bird screen system on one paper machine at the Kenora, Ont. plant. 6 illustrations. M.W.

PAPER SPECIALTIES

ANDERSON, RALPH J. Protecting large stacks of baled straw with Sisalkraft. Tappi 34, no. 9: 122A; discussion: 122A (September, 1951).

Developments in the use of Sisalkraft covers for baled hay and straw are discussed. E.S.

DAY, FREDERICK T. Choosing the paper for the job. Brit. Packer 13, no. 8: 27-8 (August, 1951).

The suitability for particular uses of various types of papers, including coated or art papers, chromo papers, and metal papers, is discussed. M.W.

DAY, FREDERICK T. Paper conversion and usage. No. 15. Window bill and transfer papers—their application and uses. World's Paper Trade Rev. 136, no. 5: 322, 327-8 (Aug. 2, 1951).

A brief survey of the various types of transfer and label papers, either transparent or opaque, and methods of positive or negative printing by different processes is presented. The introduction of specially prepared body papers coated with a cellulose film has been a great help to many printers. E.S.

DAY, FREDERICK T. Paper conversion and usage. No. 16. Parts 1 and 2. The manufacture and correct application of gummed sealing tapes. World's Paper Trade Rev. 136, no. 7: 432, 434, 436; no. 9: 614, 619-20 (Aug. 16, 30, 1951).

Information is presented on the body paper, adhesive coating, coating process, and control methods in the first part of the article; the second part deals with controlled lengths of tape, efficient moistening devices, and correct methods of application. 17 figures. E.S.

DAY, FREDERICK T. Paper conversion and usage. No. 17. Specialty papers for the printer. World's Paper Trade Rev. 136, no. 11: 724, 726, 728 (Sept. 13, 1951).

Certain special papers are discussed which the printer may use for a job where an outstanding or unusual cover for a booklet or an attractive folder, broadsheet, box top, or similar kind of work is required. The established fancy papers, flock papers, metal-foil and metal-lined papers, and fancy papers for special occasions find consideration. Every taste and need can

be met from every point of view, including color, style, embossing pattern, motif, and price for a variety of uses. New ideas and patterns continually appear; their survival is a matter of consumer appeal. 1 illustration. E.S.

EVANS, CLAUDE M. Gummed & pressure sensitive tapes. Am. Paper Merchant 48, no. 9: 23, 64 (September, 1951).

The types and properties of gummed kraft tapes, water-resistant tapes, reinforcement tapes, and specialty tapes which meet government specifications are described. 1 table. M.W.

FAGG, ELIZABETH. Paper service for isolation patients. Paper & Twine J. 25, no. 4: 8-9 (June, 1951).

The use of all-paper food service for isolation patients in hospitals eliminates the danger of cross-infection, and the expense is compensated for in economy of time and effort expended by nurses and auxiliary workers. 1 illustration. M.W.

GODDING, J. L. Raw stock requirements for gumming, waxing and breadwrap grades. Can. Pulp and Paper 4, no. 9: 6-7 (September, 1951).

The requirements of gumming kraft and sulfite grades for use in converting are: high Mullen and tear, consistent basis weight and caliper, sound roll condition (freedom from hard and soft spots, hard edges, moisture pockets, etc.) and high finish with a low oil-absorption test. A consistently high finish is the prime requisite for waxing krafts, followed by a low oil-absorption test, adherence to basis-weight specifications, and sound roll conditions. For the breadwrapper grade the most important feature is evenness of roll; other requisites include cleanliness of stock, consistent basis weight and caliper, and a uniformly high finish. M.W.

M. A. Carbon paper. Papeterie 73, no. 8: 435, 437-9 (August, 1951). [In French]

Following a brief outline of the history of carbon paper which dates from the invention of Turri di Castelnuovo in 1808, special kinds of carbon paper are defined. Some of the precautions required in its manufacture are mentioned, and a few German and American ink formulas are included. Dyestuffs (violet, blue, and purple) are often blended with carbon black. The machinery employed and methods of coating, winding, cutting, and testing the finished carbon paper are described. 2 references. L.E.W.

MORRIS, CHARLES V. Today's problems demand ingenuity in paper men. Paper & Paper Products 92, no. 24: 1, 10 (Sept. 5, 1951); *cf.* B.I.P.C. 22: 34.

Examples of the successful substitution of unobtainable stocks for rush orders by different paper merchants are given. E.S.

SEIDL, ROBERT J. Two symbols of a venerable craft. Paper Maker [U. S.] 20, no. 2: 44-8 (September, 1951).

A description is presented of a Japanese scroll on which the making of hand papers is depicted, and of a sheet mold which is constructed of Japanese cypress, bamboo, copper, and silk and used for making paper by hand. 12 illustrations. M.W.

TAYLOR, H. W. Heat seal packaging values. Paper & Paper Products 92, no. 24: 10-11 (Sept. 5, 1951); Graphic Arts Monthly 23, no. 10: 182, 184, 186, 188 (October, 1951).

The advantages of heat-sealing papers (particularly Pervenac WP-1 and CL made by Nashua Gummed and Coated Paper Co.) for domestic and export packaging and pharmaceutical labels is emphasized; reference is also made to delayed-action adhesives and recent developments in labeling machinery. E.S.

PECTIN

HINTON, C. L. The polyuronides. Ann. Rev. Biochem. 20: 67-86 (1951).

A review of the chemistry of the polyuronides is presented which covers, for the most part, the developments during the period from 1940 to 1950. 148 references. M.W.

PHYSICAL TESTING—INK

HULL, HARRY H. Viscoelasticity of printing ink. Am. Ink Maker 29, no. 9: 33-5, 70 (September, 1951); *cf.* B.I.P.C. 21: 571.

With regard to the formation of filaments by printing ink it is demonstrated that ordinary frictional dissipation of energy is not consistent with the mechanics of filament formation, and that surface tension will hinder rather than promote their formation. It is also shown that the elastic properties of ink are important factors in determining filament formation between the parting surfaces of the film, and therefore, viscoelasticity should be considered in studying the printing properties of an ink. 7 figures and 8 references. M.W.

KING, CHARLES F. Inkometer measures length and tack of inks. Inland Printer 127, no. 5: 78-9; no. 6: 66 (August, September, 1951); *cf.* B.I.P.C. 10: 170.

Some of the problems of multicolor letterpress and offset printing which can be solved through the use of the Inkometer, a device developed by the Lithographic Technical Foundation, are discussed. The limitations of the instrument and desirable improvements are also considered. 1 illustration. M.W.

PHYSICAL TESTING—PAPER

TAYLOR, JACK. Rule of thumb for printing papers. Am. Paper Merchant 48, no. 9: 25, 62-3 (September, 1951).

A series of tests is presented which do not require scientific apparatus and which can be used by the paper merchant for determining the quality of paper for printing. These include tests for finish, formation, opacity, strength, surface sizing, caliper and bulk, bursting strength, pasted bristols and covers, coating, grain, and curl and stretch. The information is taken from the author's book "The characteristics and functions of printing papers." M.W.

PHYSICAL TESTING—PAPER—MACHINE DIRECTION

DAY, FREDERICK T. Paper conversion and usage. No. 13. Grain direction in paper—its importance to the printer. World's Paper Trade Rev. 136, no. 1: 34-5 (July 5, 1951).

The importance of grain direction in printing and conversion processes (folding and bookbinding) is emphasized, supplemented by simple tests to determine the machine and cross-machine directions. Another significant

factor is the accurate square cutting of sheets for satisfactory feeding to the printing press; badly cut sheets will require an extra trim on the guillotine. In the case of printed cards for filing, the grain should run the long direction of the cut card, resulting in snap and rigidity; if the cards are cut both ways, some will be snappy and easy to handle, whereas others will be limp. 2 figures. E.S.

PHYSICAL TESTING—PAPER—PRINTABILITY

BEKK, JULIUS. Testing the suitability of paper. Allg. Papier-Rundschau no. 12: 505-6 (June 26, 1951). [In German]

Reference is made to the comparatively recent demand for testing procedures which will indicate the suitability of a paper for a given purpose and the lack of correlation of some of the older tests with actual use requirements. As an example, the difference between breaking load and breaking stress is discussed, and the preference for dynamic strength testing is mentioned which has recently come to the fore. Another instance is the different meaning imparted to the terms "sizing" and "size resistance." The absorptivity of paper for different liquids is not identical, so that the particular liquid in question should always be listed; in the case of printing ink, the type of ink should be specified. Ink absorptivity, however, is not the only important factor in printability use requirements; the quality of the print depends upon the deformations to which the ink is subjected during its transfer from the screen to the paper surface and these, in turn, will be influenced by the consistency of the ink and its tendency for pulling threads, and the rate at which the ink is absorbed. The uniformity of ink absorption also plays a role; coated papers possess a much more homogeneous surface structure and are therefore superior in uniform ink absorptivity to uncoated, supercalendered papers. In view of the complexity of all these factors, experimental printing presses will undoubtedly give the best summative information about the printing suitability of a paper; however, their application is rather complicated and is not the answer for simple mill-control procedures. E.S.

PHYSICAL TESTING—PAPER—WIRE OR FELT SIDE

SPICHER, CRAIG. Finding paper grain. Printing Equip. Engr. 81, no. 12: 25 (September, 1951); 82, no. 1: 47 (October, 1951).

The wire and felt sides of a sheet of machine-coated paper may be determined by first finding the grain by folding the sheet and then tearing a semicircular corner of the sheet perpendicular to the grain. The tear should be made with a circular motion to show a splitting of the coating from the pulp. A similar tear should be made on the reverse side and the results compared. The felt side shows the greatest removal of coating. 2 illustrations. M.W.

PHYSICAL TESTING—PULP—SAMPLING

STEWART, R. M. An automatic sampler for paper mill use; a gadget competition entry. Pulp Paper Mag. Can. 52, no. 9: 116-17 (August, 1951).

An automatic, vacuum-controlled sampling system presently in use in one mill on paper-mill sewers, white-water seal pits, and Haug refiner and shredder stock is described; it is well adapted to operations where vacuum pumps or drop legs are readily available. The only maintenance required is a periodic flushing of the lines and a check on the vacuum as adjusted by globe valves. The chief advantages of the system are low initial cost, low maintenance, and adaptability to otherwise inaccessible places and to various grades of stock; it has been in operation in the mill for one year with very good results. 1 diagram. E.S.

PHYSICAL TESTING—TACK

ANON. A German instrument for testing the bonding strength (tack) of gummed papers. Allg. Papier-Rundschau no. 12: 503 (June 26, 1951). [In German]

An instrument is described which was developed by Neubronner and is now manufactured by Karl Frank G.m.b.H., Weinheim-Birkenau. Round paper samples of standard size are cut and screwed to the bottom of a piston with the gummed side facing out and wetted uniformly with a viscose sponge, whereupon the piston carrying the wetted sample is pushed forward by pneumatic pressure against a cardboard surface with which it remains in contact for different periods (two, four, six, and 10 seconds) which are measured automatically by a stop watch. The piston is then drawn back and the force (atmospheres) required to separate the piston plus paper from the cardboard is indicated by a manometer. All operations are automatic. The average of at least 10 measurements indicates the bonding strength of the sample. 2 illustrations. E.S.

PLASTIC FILMS—TESTING

CUTLER, JANICE A., KAPLAN, E., MCLAREN, A. D., and MARK, H. The permeation of vapors through polyethylene. Tappi 34, no. 9: 404-7 (September, 1951).

The data presented in this report are limited to the vacuum permeation of a number of vapors through polyethylene. A new empirical relationship for the permeation constant P was established from the results of this study. P is not only not constant with respect to the pressure differential, but appears to be a linear function of the vapor pressure of the permeating molecule. The results of the present limited studies differ from those published in the comprehensive investigations made by Simril and Hershberger (*cf.* B.I.P.C. 20: 896). 3 tables, 4 figures, and 6 references. E.S.

PLASTICS—PAPER-BASE

MODERN PLASTICS. Laminates unlimited. Parts 1 and 2. Modern Plastics 28, no. 12: 73-9, 176, 178; 29, no. 1: 87-91 (August, September, 1951).

In Part 1 the applications of industrial high-pressure laminates in textile, electrical, and refrigeration machinery are discussed, and the resins and fillers (including the various types of papers) which are used industrially are described. Several of the diversified mechanical applications of laminates are described in the second part of the article. 36 illustrations. M.W.

PLASTICS—TESTING

MEYER, L. W. A., and GEARHART, W. M. Ultraviolet inhibitors for cellulose acetate-butyrate plastics; phenyl hydroxybenzoates, hydroxyphenyl benzoates and their methyl ethers. Ind. Eng. Chem. 43, no. 7: 1585-91 (July, 1951).

A study of the isomers of phenyl *o*-hydroxybenzoate as weathering agents for cellulose plastics is presented. The most effective agents of those studied include *m*-hydroxyphenyl benzoate, *p*-hydroxyphenyl benzoate, phenyl *o*-hydroxybenzoate, and *o*-hydroxyphenyl benzoate. Compounds susceptible to quinone formation tend to become yellow on exposure. Those with methoxyl substituents are less effective than the corresponding hydroxy compounds. The data indicate that a high degree of weathering damage is caused by

photochemical effects; moisture also accelerates breakdown. [Abstractor's comments: Of special interest to lignin chemists are the optical density and ultraviolet absorption curves before and after irradiation, particularly for those phenyl benzoates in which the hydroxy and methoxy groups are on the phenol constituent of the ester.] 3 tables, 12 figures, 7 references. H.F.L.

POLYMERIZATION

WINDING, CHARLES C. Polymerization. Ind. Eng. Chem. 43, no. 9: 1997-2006 (September, 1951); *cf.* B.I.P.C. 21: 108.

The patent and periodical literature related to the unit process of polymerization, which was published during 1950, is reviewed. 377 references. M.W.

PRINTING AND PRINTER'S INK

BERNSTEIN, I. M. Lithographic dot contour. Am. Ink Maker 29, no. 9: 29-32, 66-7 (September, 1951).

The lack of halftone dot contour sharpness in lithography is discussed. In a series of photomicrographs the halftone sharpness obtained by the lithographic offset process and by the letterpress process is compared, and from these it is concluded that the distortion of offset dots may be in part attributed to the grain of the plate. The other major factor in dot distortion is the resiliency of the blanket. The availability of the smoother-coated papers for offset lithography should contribute to the correction of this defect. 12 photomicrographs. M.W.

DAY, FREDERICK T. Paper conversion and usage. No. 14. The printer and the paper maker. World's Paper Trade Rev. 136, no. 3: 186-8 (July 19, 1951).

The importance of a greater sharing of knowledge and an interchange of ideas in the papermaking and printing trades is emphasized, including frequent mutual visits of printers to paper mills and papermakers to printing plants. A definition of the terms "overlays" and "underlays" is given. 2 illustrations. E.S.

DRURY, CHARLES W. Fitting the job to the paper. Graphic Arts Monthly 23, no. 9: 21-2, 24, 26, 28, 30, 34 (September, 1951).

Following a series of definitions of terms common to the paper industry, information of value to the printer is presented on selection, weights, grain, the figuring of stock, spoilage, and the computation of the weight and cost of paper. 1 table and 5 figures. M.W.

ENGELHART, L. F. Paper and board characteristics that affect inks and printability. Tappi 34, no. 9: 112-21A (September, 1951); *cf.* B.I.P.C. 22: 40.

The author discusses the following 12 paper and board characteristics which exert a decisive influence upon inks and printability: surface smoothness, ink receptivity and affinity, surface strength or pick resistance, color and surface reflectance, opacity, dimensional stability, body strength, chemical reactivity, surface abrasiveness, grain and formation, moisture content, and uniformity. 2 tables. E.S.

LIEBENOW, J. GUS. Gloss inks on boxboard. Printing Equip. Engr. 81, no. 12: 25-6 (September, 1951); *cf.* B.I.P.C. 21: 723.

The problems encountered in printing on boxboard with gloss inks are discussed, and the reasons for these difficulties are explained. M.W.

STEINBAUER, H. R. Is aniline printing still used? Allg. Papier-Rundschau no. 13: 554-5 (July 12, 1951). [In German]

From the early beginnings with candy and similar inexpensive paper wrappers, the aniline process has made possible mass-production printing on cellophane and other transparent films, and has now spread even to the graphic arts, principally for advertising matter, blocks, almanac blocks, and similar short-lived purposes where extensive fastness to light is not of prime importance. With reference to the astounding progress which the process has made in the United States during the last decade, the importance of further studies and advances in the manufacture of rubber stereos in Germany is emphasized. 2 figures. E.S.

WHEELWRIGHT, WILLIAM BOND. Paper money. Paper Maker [U. S.] 20, no. 2: 21-5 (September, 1951).

The author describes his visit to the Bureau of Engraving and Printing of the U. S. Treasury Department, and explains the processes employed in printing paper money, with special emphasis on the precautions necessary to prevent counterfeiting. 3 illustrations. M.W.

PRINTING AND PRINTER'S INK—PLASTICS

BERNSTEIN, I. M. Gravure printing of plastic films. Share Your Knowledge Rev. 32, no. 12: 17-21 (September, 1951); Am. Printer 132, no. 9: 45, 82, 87 (September, 1951).

The author discusses the properties of gravure inks which are necessary for good printability, fast drying, adhesion, and flexibility when used on plastic films, glassine, and foil. M.W.

RAYON—VISCOSE PROCESS

CHEN, CHIAN-YUANG, MONTONNA, RALPH E., and GROVE, C. S., JR. Configuration and structure of cellulose xanthate. Tappi 34, no. 9: 420-7 (September, 1951).

An equilibrated viscose solution, prepared in the laboratory by standard procedures, was studied to determine the configuration and structure of the cellulose xanthate. The main results are summarized as follows: average degree of substitution, $D = 0.721$; glycol groups per glucose unit, $G = 0.525$; free glucose, $g_0 = 0.279$; monoxanthate, $g_m = 0.721$; dixanthate, g_d = trace; trixanthate, $g_t = 0$; xanthate groups at position 6, $X_6 = 0.243$; xanthate groups at position 2, $X_2 = 0.270$; xanthate groups at position 3, $X_3 = 0.208$; glucose anhydride 6-xanthate, $C_6 = 0.243$; glucose anhydride 2-xanthate, $C_2 = 0.270$; glucose anhydride 3-xanthate, $C_3 = 0.208$; and free glucose anhydride, $C = 0.279$. 4 tables, 2 figures, and 36 references. E.S.

GÄRTNER, F., and SAMUELSON, O. Emulsion xanthation of cellulose. Part IV. Svensk Papperstidn. 54, no. 15: 501-4 (Aug. 15, 1951). [In English; German and Swedish summaries] *cf.* B.I.P.C. 22: 43.

In the present study experimental conditions for emulsion xanthation were purposely selected so that an incomplete dissolution of the samples resulted; a hot alkali-treated spruce sulfite pulp, a cold alkali-treated (mercerized) spruce sulfite pulp, and a mercerized rayon were employed. The undissolved

residue was treated with hydrochloric acid, and the densities of the regenerated celluloses were determined according to the flotation method in carbon tetrachloride of Hermans and co-workers (*cf.* B.I.P.C. 16: 494; 21: 310). In all cases decreases in density resulted, although to different extents, when the emulsion xanthation was carried out with a large excess of carbon disulfide, whereas hardly any change could be noted when small quantities were employed. When unmercerized rayon was emulsion xanthated, a slight increase in the density of the residue could be noted. Quantitative x-ray determinations of the crystallinity of the undissolved residues confirmed the above results. 2 tables, 2 figures, and 10 references. E.S.

TAIT, C. W., VETTER, R. J., SWANSON, J. M., and DEBYE, P. Physical characterization of cellulose xanthate in solution. J. Polymer Sci. 7, no. 2/3: 261-76 (August-September, 1951).

The intrinsic viscosity of cellulose xanthate solutions was studied as a function of the electrolyte content of the solvents and found to decrease sharply with an increase in electrolyte concentration. All electrolytes tested, except sodium and lithium hydroxides, produced essentially the same reduction in intrinsic viscosity for solutions of equivalent ionic strengths, indicating that the effect was largely one of interaction between the solvent ions and the charged xanthate groups. Hydroxides induced a greater viscosity reduction. The reason for this was not fully resolved; however, indications were obtained that the hydroxides, in addition to behaving as electrolytes toward the charged xanthate groups, also interact with the hydroxyl groups on the parent cellulose chain. Light-scattering measurements, as well as data on the variation of the intrinsic viscosity with molecular weight in various solvents, showed that the change in intrinsic viscosity with electrolyte concentration could be accounted for by a change in configuration, or a degree of coiling of the molecule. Calculations indicated that in pure water, cellulose xanthate should approach a rigid rod configuration, whereas in 6% caustic coiling occurs, and the molecule assumes more of a random configuration. 2 tables, 9 figures, and 14 references. E.S.

REDWOOD

LEWIS, HARRY F. Redwood as a potential source of pulp. Tappi 34, no. 9: 385-90 (September, 1951).

Substantial quantities of redwood are available for conversion to pulp; these include the nonmerchantable lumber from the mill, lumbering wastes in the woods, and second-growth thinnings. Old-growth redwood has a relatively low density and high extractives and lignin content; conventional chemical pulping processes therefore are not attractive economically. Because of its fiber characteristics, such wood makes a desirable raw material for conversion by the Asplund process into roofing or flooring felt. Second-growth redwood is more attractive for conversion by the sulfate process into unbleached and bleached pulps of good quality. 4 tables and 2 figures. E.S.

RESEARCH LABORATORIES

ANON. Engineering, research at Lowell Textile. Paper Mill News 74, no. 37: 74 (Sept. 15, 1951); *cf.* B.I.P.C. 21: 111-12.

A very brief reference is made to the research and educational activities at Lowell Textile Institute during the past year. M.W.

ANON. Pulp & Paper Research Institute of Canada. Paper Mill News 74, no. 37: 84, 86 (Sept. 15, 1951).

The scope of research work carried on by the Institute is summarized, and

some specific problems which have recently been investigated are described. The Institute became a separate legal entity in 1950, and since then has been carrying on specific investigations for individual companies in addition to its academic training in the field of pulp and paper. M.W.

ANON. Research at The Institute of Paper Chemistry—1950-51. Paper Mill News 74, no. 37: 72, 74 (Sept. 15, 1951); *cf.* B.I.P.C. 21: 111.

A summary of the research which has been initiated during the past year is presented. In addition, the titles of recently completed and current doctoral theses are listed. M.W.

ANON. Research on utilization of wood and wood waste for pulp. Paper Mill News 74, no. 37: 66, 68, 106 (Sept. 15, 1951); *cf.* B.I.P.C. 21: 112.

During the past year, investigations have been carried on at the U. S. Forest Products Laboratory concerning the use of semichemical pulps for making bond and book paper, the applications of the cold soda process, the effectiveness of several chemicals as hydrolyzing agents, the possibilities of obtaining high-alpha pulps from aspen, effects of bark on the yield and quality of kraft pulps, and the use of Colorado beetle-killed Engelmann spruce. M.W.

POTTER, G. J. C. The chemical pulping laboratory at the Pulp and Paper Research Institute of Canada. Pulp Paper Mag. Can. 52, no. 9: 90-4 (August, 1951); Proc. Tech. Sect., Can. Pulp Paper Assoc. 37: 187-91 (1951); *cf.* B.I.P.C. 21: 40.

The new chemical pulping laboratory is now completely equipped to do laboratory cooking on both 1/1000 and 1/100,000 mill scale. Four stainless-steel digesters, three of 2-cu. ft. and one of 100-g. capacities, have been installed, including accumulators and other auxiliary apparatus, and are now in operation. This equipment, in conjunction with the Institute's screening system and testing laboratories, makes possible the cooking of mill chips under a wide range of controlled conditions; the resulting pulp can be screened and evaluated with a full series of chemical and physical tests. Refining and bleaching equipment will be added to the plant in the near future. A detailed description of the present installations is given. 11 figures, including 1 floor plan. E.S.

ROSIN

COLLINS, DAVID N., and PATTON, E. L. A new tack for gum naval stores. Chem. Eng. 58, no. 9: 154-6 (September, 1951).

Although the Olustee process for refining naval stores has greatly increased production, as a result of the Korean War and a shortage of manpower the stocks of naval stores have decreased, and indications are that the domestic demand for rosin and turpentine will continue to increase. Both products are being utilized in new ways in chemical industries. However, their lack of chemical individuality limits their applications, and the author suggests the use of rosin derivatives or crude pine gum, without intermediate conversion to turpentine and rosin, as basic raw materials from which chemicals of value in protective coatings, pharmaceuticals, etc. can be obtained. 2 illustrations and 2 flow sheets. M.W.

GRENEKER, EUGENE F., JR. Out of the cracker barrel. Am. Forests 57, no. 9: 6-9, 45, 47 (September, 1951).

The growth and development of the naval stores industry of the South is described. Credit is given to the American Turpentine Farmers Association for the introduction of modern production and merchandising practices which have helped to revitalize the industry. 8 illustrations. M.W.

SAFETY

ALLEY, HAROLD R. Paper products can be used to promote safety. Am. Paper Converter 25, no. 9: 9, 44-5 (September, 1951).

The author points out an opportunity for paper converters to help promote safety through the production of paper items printed with safety slogans. Several examples of such items include cups, napkins, blotters, tags and labels, tape, food wrappers, etc. Suggestions for appropriate slogans and possible markets may be obtained from the National Safety Council. 3 illustrations. M.W.

SEMI-CHEMICAL PULPING PROCESS

KLEMM, KARL HEINZ. The utilization of lignified fibrous pulps in the manufacture of paper and board. Das Papier 5, no. 10: 194-202; no. 15/16: 339-43 (May, August, 1951). [In German]

The purpose of the present investigation was a study of the possibilities for a more complete utilization of the wood substance in papermaking, as presented by the application of high-yield (lignified) pulps. Following a brief discussion of the anatomic structure and chemical composition of the raw material wood and the role played by lignin, the different methods for the production of lignified pulps are reviewed (Masonite process, Asplund-Defibrator process, standard and steamed groundwood, semichemical processes, and chemigroundwood, as well as a brief mention of the standard sulfite and alkaline processes). In the standard groundwood process, approximately 90-95% of the (airdry) wood substance is utilized; in steamed groundwood, 70-82%; in chemigroundwood, 85-90%; in semichemical pulping, 75-85% (although higher yields have also been listed); and in the standard sulfite and sulfate processes, about 45-50%. Although various procedures for the production of high-yield pulps are available, most of them are still in the development stage. The lignified pulps, apart from groundwood, can in most cases be applied to paper or board manufacture directly only to a limited extent. The possibilities of arbitrary mixtures of coarse and fine fractions (standard and steamed groundwood with the addition of larger percentages of fine fractions, and groundwood and Defibrator pulp mixtures with and without fine fractions) were investigated; the determination of the initial wet strength of such mixtures was found to be a useful criterion for their evaluation. The results show conclusively that Defibrator pulps have different characteristics from other high-yield pulps and that they cannot be considered for pulp and board manufacture (even as partial component) without additional modifications, such as hot pressing applied in the manufacture of hardboards. Whereas the groundwood-fine fraction mixtures produced a maximum in initial wet strength at a certain mixing ratio, this optimum in the case of Defibrator pulps was only reached with economically nonfeasible amounts (65-70% of fine fraction). Experiments with beating (following a soaking period of two hours) of Defibrator and steamed groundwood pulps in the Jokro mill showed that the former resulted in the cutting of fibers only, without fibrillation, whereas the latter showed cutting and fibrillation. When Defibrator pulp (after soaking 40 hours) was beaten in an experimental hollander, the milder treatment and the long soaking period produced improved results; fibrillation was noticeable in addition to cutting. Experiments with mixtures of

beaten Defibrator pulp and steamed groundwood resulted in the development of favorable characteristics and a definite maximum of the initial wet strength, so that the application of beaten lignified pulps to the manufacture of paper and board appears to be quite feasible. 8 tables, 14 figures, and 18 references. E.S.

OLSON, K. E., and MARTENY, W. W. Kraft semi-chemical pulping. Paper Trade J. 133, no. 10: 118-20, 122, 124, 126 (Sept. 7, 1951).

A detailed description of the semichemical process employed at the National Container Corp. of Wisconsin, Tomahawk, is presented; the wood furnished consists of 100% hardwood (poplar, birch, maple, elm, and ash). 6 tables, 13 illustrations, and 1 flowsheet. M.W.

RUNKEL, ROLAND O. H. Semichemical pulps. Das Papier 5, no. 15/16: 329-38 (August, 1951). [In German]

The author presents an extensive review of the historic development and the fundamental principles of semichemical and chemigroundwood processes, including recent American results, developments in machinery and equipment, and economic factors involved. The possibilities of industrial applications in Germany (where some of the basic research was carried out by the author in the period from 1925 to 1930) are discussed, with particular reference to beech and poplar. 6 tables, 11 figures, and 44 references. E.S.

WRIGHT, C. E. Florida's new process. Paper Trade J. 133, no. 11: 28-9 (Sept. 14, 1951).

Arrangements have been completed to establish a pilot plant at the University of Florida for a rapid continuous pulping process to be used for the production of high-strength kraft pulps from southern pine and the manufacture of dissolving pulps from scrub oak and other hardwoods. The process reduces the pulping time to 15 or 20 minutes as against the four hours for standard procedures. Its principal characteristics include the maintenance of constant concentration and temperature and the rapid reaction between the chemicals and wood during the cook. The process consists of three steps: a rapid steaming process to soften the lignin in the chips, mechanical subdivision of the chips, and the continuous treatment of the expanded chips with regular kraft liquor at elevated temperatures for about 15 minutes. Two special precautions have been found advisable: the addition of sodium carbonate to the chip-steaming liquor to keep it alkaline and thus prevent acid hydrolysis, and the splitting of the chips with the grain to prevent any harm to the fiber in the mechanical treatment of the wood. A preliminary survey indicates that a substantial saving in steam and wood consumption is possible with this process. The air flotation method of debarking the scrub oak (*cf.* B.I.P.C. 21: 786) is being employed (*cf.* also Chem. Week 69, no. 13: 12 [Sept. 29, 1951]). 2 illustrations. M.W.

SHIPPING CONTAINERS

ANON. Boxed potatoes. Modern Packaging 25, no. 1: 112-14 (September, 1951).

Preliminary findings of Oregon-potato package studies indicate that in-transit physical damage to potatoes is reduced considerably when rigid corrugated shipping containers are used. The research program's findings to date have shown that a container which holds 50 lb. of potatoes in bulk is the most practical from a cost standpoint, comparing favorably with the

cost of the burlap sack. As a result of the first tests, the original design of this size carton has been modified to improve the rigidity and handling ease. 10 illustrations. M.W.

ANON. From bags to boxes. Boxboard Containers 69, no. 705: 33 (September, 1951).

Packaging of Grabler pipe fittings in Gair corrugated containers has eliminated the problems of cleaning and sorting which accompanied the former bulk handling methods. Fittings shipped in corrugated containers are clean and protected from damage, and the labeled cartons afford easy handling in making up orders. 2 illustrations. M.W.

THOR CORPORATION, *Chicago.* Simplified appliance pack. Modern Packaging 25, no. 1: 98-9 (September, 1951).

In the packaging of its Gladiron portable home ironer in a new package which consists of a specially designed fiberboard pallet base and a 275-lb. test, double-wall, corrugated carton, Thor Corp. has effected economies in packaging materials and shipping costs and has gained additional protection to the unit. The use of the former package, a wire-bound wood-veneer box with a wooden pallet-type base, involved many difficulties in assembly and handling which have been eliminated with the new package, and considerable labor saving has been achieved. 6 illustrations. M.W.

TILLY, JAMES O. 'Easy opening' device for paperboard containers. Packaging Parade 19, no. 224: 86-8 (September, 1951).

A device to facilitate opening paperboard containers is described. Basically, it consists of two sheets of 30-lb. kraft paper bonded together with spotted adhesive; the insert is then applied to the inside-end flap area in the normal manner. Bonding is done between the glazed sides of the paper to prevent the adhesive from bleeding through the insert and impregnating the facing of the container. The sealing insert provides a more effectively sealed container which will insure safer shipment and will permit re-use of the container; because it makes the container easier to open, it will result in a saving of labor. A report of tests conducted by The Don L. Quinn Co. laboratory to determine the adequacy of the container closing method is also presented. 9 figures. M.W.

SHIPPING CONTAINERS—MULTIWALL BAGS

PIGOTT, GEORGE M. Paper bags for fish meal. U. S. Department of the Interior. Fish and Wildlife Service Technical Note no. 10: 1 p. (September, 1951).

Kraft paper multiwall bags are now being used extensively in the West Coast fishmeal industry. Most bags are made of 50-pound kraft paper with three to five plies. One ply of asphalt paper is usually used in long-distance shipping to reduce fire hazards caused by heating meal. M.W.

SHIPPING CONTAINERS—PALLETIZING

LATCHAW, RALPH. 115,000 multiwall bags palletized into 46 units. Packaging Parade 19, no. 224: 84 (September, 1951).

The advantages of palletized shipping of multiwall bags are reported by a Minneapolis feed concern which received from Union Bag a full carload shipment with 46 palletized units of multiwall bags. Each unit was loaded onto an expendable paper pallet which consisted of two flat decks of double-

wall corrugated board connected by legs from wound corrugated board. The bags suffered no damage during transit, and an estimated $75 per carload was saved in the unloading operation. 6 illustrations. M.W.

NATIONAL BISCUIT COMPANY. Strapped pallets replace carton bundling at Nabisco. Boxboard Containers 69, no. 705: 8-10, 12 (September, 1951).

A description is given of the palletizing procedure used for shipping volume quantities of carton blanks. 13 illustrations. M.W.

SHIPPING CONTAINERS—STATISTICS

BETTENDORF, HARRY J., and HELME, ROY V., JR. Fibre box industry statistics. Fibre Containers 36, no. 8: 152, 154, 156, 158, 160-7 (August, 1951); *cf.* B.I.P.C. 21: 43.

In 1950 new records were obtained in practically all phases of fiber box-industry statistics; rail loss and damage claims dropped to the lowest since 1945, particularly in the early part of the year. The greatest relative growth continued in the South and Pacific areas of the industry; the greatest footage growth was shown in connection with double-faced, corrugated board. Detailed statistical information on solid-fiber and corrugated boxes is given in numerous tables and pie and block charts. E.S.

HANWAY, PAUL S., BETTENDORF, HARRY J., and HELME, ROY V., JR. Fibre can and tube industry statistics. Fibre Containers 36, no. 8: 194-6 (August, 1951); *cf.* B.I.P.C. 21: 43.

The 1950 value of 127 million dollars for fiber cans and tubes showed an increase of 97% over the 1949 value; this substantial increase is in part due to the addition of the ammunition and related types of containers to the industry's regular value. The rest resulted from the stepping up of the output from a four-day operation on a one-shift basis to a six-day operation on nearly a two-shift basis, as demands increased materially, particularly in the second half of 1950. It is estimated that the normal volume of industry was about 66% over 1949. 1 table and 1 chart. E.S.

MATHER, GLENN, BETTENDORF, HARRY J., and HELME, ROY V., JR. Fibre drum industry statistics. Fibre Containers 36, no. 8: 197-8, 200-3 (August, 1951); *cf.* B.I.P.C. 21: 43.

Following an introduction dealing with the geographical distribution of plants, freight regulations for cylindrical shipping containers, performance of fiber drums, new developments (including plastic bag liners and boots for extra strength, as well as "overkegs" for thin-walled metal containers), and applications, statistical data are presented which indicate the general growth of the industry. In 1950 it is estimated that 26 million units were produced in 20 plants, an increase of more than six million units over the number manufactured in 1949. 1 table, 4 illustrations, and 1 graph. E.S.

SHIPPING CONTAINERS—TESTING

PACKAGE RESEARCH LABORATORY, *Rockaway, N.J.* New incline impact testing device developed. Packaging Parade 19, no. 224: 84-5 (September, 1951); Fibre Containers 36, no. 9: 113 (September, 1951); Wood 6, no. 10: 80, 82 (October, 1951).

A recently developed, improved incline impact (Conbur) testing device

will accommodate loads up to 1000 lb. and packages 78 in. high or 76 in. wide, and may be used by only one operator. 3 illustrations. M.W.

STARCH

LAMBERT, JACK L. Linear starch reagents; cadmium iodide-linear starch reagent. Anal. Chem. 23, no. 9: 1247-51 (September, 1951).

A cadmium iodide-linear starch reagent is described which makes possible the first satisfactory utilization of the starch-iodine reaction for colorimetric determinations of trace amounts of oxidizing substances. The reagent is colorless, unaffected by age, capable of giving highly reproducible results, and has the added convenience of stability. The intensity of the starch-iodide blue color which is developed in the solution was found to be directly proportional to the concentration of the oxidizing agent over relatively wide ranges. The rate of color development was studied, and the extinction coefficient determined. 2 tables, 4 figures, and 25 references. M.W.

LAMBERT, JACK L. Linear starch reagents; linear starch-iodate reagent selective for iodide ion. Anal. Chem. 23, no. 9: 1251-5 (September, 1951).

A colorimetric reagent which contains linear *A*-fraction potato starch, iodate ion, and cadmium ion was studied. It proved to be stable for periods up to six weeks and to be selective for iodide ion when used in a solution of a weak acid such as formic acid. The reaction of the iodate ion and iodide ion to produce the triiodide ion, which reacts with the linear starch to form the blue complex, gives reproducible and quantitative results. A study of interferences indicated that small amounts of many common inorganic and organic substances can be tolerated. The rate of color development and the effect of temperature were studied, and the extinction coefficient was calculated. The analytical use of this reagent should prove to be of value in water purification. 1 table, 5 figures, and 4 references. M.W.

MOE, OWEN A., MILLER, SIDNEY E., and BUCKLEY, MARJORIE IWEN. Periodate oxidation of the formyl esters of starch. J. Am. Chem. Soc. 73, no. 9: 4185-6 (September, 1951).

The formyl esters and the 2-cyanoethyl ethers of diverse starches have been subjected to periodate oxidations, and it has been found that the consumption of oxidant is dependent on a number of variants. The results of the current study show that the selectivity of the periodate is dependent on the concentration of the oxidant and the pH of the media. 3 tables and 6 footnotes. E.S.

STATISTICAL METHODS

AMERICAN CHEMICAL SOCIETY. *Division of Industrial and Engineering Chemistry.* Statistical methods in chemical production. Ind. Eng. Chem. 43, no. 9: 2053-73 (September, 1951).

This symposium includes the following papers: Seder, Leonard A. A new science of trouble shooting—9 references, p. 2053-9; Youden, W. J. Locating sources of variability in a process—3 references, p. 2059-62; Bennett, Carl A. Application of tests for randomness—6 references, p. 2063-7; Brownlee, K. A. Correlation methods applied to production process data—4 references, p. 2068-71; and Smallwood, Hugh M. Statistics training for chemists—2 references, p. 2071-3. Tabulated data and figures accompany most of the articles. M.W.

ANDERSSON, OLLE. Pulp quality and paper quality. Svensk Papperstidn. 54, no. 15: 505-9 (Aug. 15, 1951). [In Swedish; English and German summaries]

Over a production period of 300 days routine tests on strength data of bag paper of constant basis weight and of the corresponding pulps from which the papers had been manufactured were evaluated statistically. Relationships based on correlation coefficients were derived from strength data obtained with machine-made paper and laboratory handsheets; this relationship is rather poor. The agreement between the properties of laboratory handsheets beaten in the laboratory beater and a mill-size jordan is considerably better. This indicates that a considerable difference exists between the properties of the sheets made on the paper machine and the laboratory sheet machine. Relationships between the different strength properties of the identical material were calculated. The relationships between bursting strength and other properties are relatively poor, whereas just the opposite holds for tear. In the case under investigation a positive correlation was found to exist between tensile strength and tear of machine-made paper, whereas a negative correlation was found between the same properties of the corresponding pulp. A possible explanation is based on a discussion of the nature of the tear test. The bursting test is discussed in detail and formulas for the stress distribution in the paper in the bursting-strength tester are given. 6 tables, 1 figure, and 3 references. E.S.

CLEVERDON, D., LAKER, D., and SMITH, P. G. The mathematical analysis of polymer fractionation data. Trans. Faraday Soc. 47, no. 8: 908-14 (August, 1951).

When a polymer is fractionated for the purpose of estimating its distribution of chain lengths, the data are ordinarily treated by the method of Mark and Raff (procedure I). This has been criticized by Beall, who has devised a method (procedure II) whereby each fraction is represented by a negative binomial distribution whose constants are fitted by the method of moments (*cf.* B.I.P.C. 20: 120-1). For the purpose of the present communication, a polystyrene has been fractionated, and the number average molecular weights of the fractions determined osmotically. The data have been evaluated by both procedures. Evidence suggests that the distribution depicted by procedure II more accurately represents the true distribution than that obtained by procedure I. 3 tables, 3 figures, and 12 references. E.S.

SULFITE WASTE LIQUOR

CHEMICAL WEEK. Wood pulpers' dividend. Chem. Week 69, no. 12: 23 (Sept. 22, 1951); *cf.* B.I.P.C. 15: 486; 18: 201.

Norconidendrin, a new antioxidant which is obtained from the spent sulfite liquor of western hemlock pulping is now in limited commercial production by Crown Zellerbach. Marketed under the trade name Conidendrol, it will find use in increasing the shelf life of several oils and oil-containing foods and may prove useful in wax-paper coatings and other food-packaging materials. Other applications include stabilizing lubricating oils, unsaturated hydrocarbon distillates, and vinyl monomers, and retarding the deterioration of butadiene copolymers. It is able to compete effectively on a price basis with a number of commercially available antioxidants, and may prove to be important in conserving the critical chemicals used in these products. 1 illustration. M.W.

MURPHY, D., and STRANKS, D. W. The production of 2,3-butanediol from sulphite waste liquor. Can. J. Tech. 29, no. 9: 413-20 (September, 1951).

Pseudomonas hydrophila, Aerobacter aerogenes, and strains of *Serratia* grown on suitably treated spent sulfite liquor gave good yields of 2,3-butanediol and ethanol in still and shake cultures. *Bacillus polymyxa* gave less satisfactory yields, and *Bacillus subtilis* grew only when the medium was mixed with sugar-beet molasses. The method of treatment of the spent sulfite liquor was simple. After boiling and aeration, the pH was set at 8.5 with ammonia or ammonium hydroxide, salts were added, and the medium autoclaved, during which the pH dropped to 5.7-6.4. In shake cultures it was necessary to add calcium carbonate to control the pH during fermentation. Good yields of products were obtained when the organisms were grown on spent sulfite liquor concentrated to half volume before treatment. Doubling the sugar content of the medium by means of sugar-beet molasses also gave good growth and yields. 6 tables and 11 references. E.S.

WHITNEY, ROY P., ELIAS, RICHARD M., and MAY, MALCOLM N. Chemical reaction equilibria in calcium and magnesium-base sulphite recovery systems. Tappi 34, no. 9: 396-400 (September, 1951).

Many sulfite pulp mills are considering possible systems of utilizing or disposing of spent sulfite liquor involving evaporation and burning. From the standpoint of recovery and re-use of inorganic chemicals in pulping, it is desirable that information be at hand regarding the chemical compounds which are formed in the recovery furnace, and regarding the effect of combustion conditions upon the extent to which each compound may be present. This paper presents the results of calculations of chemical reaction equilibria for many of the important reactions which may be involved in the combustion of calcium-base and magnesium-base spent sulfite liquor. The calculations have been based upon thermodynamic data for the several compounds of interest, compiled from the literature. They indicate the conditions under which the oxide, sulfide, or sulfate of calcium or magnesium might be expected to predominate, and suggest a possible explanation for the observed differences in composition of the ash from calcium- and magnesium-base liquor combustion. 2 tables, 4 figures, and 8 references. E.S.

SULFUR

FREEPORT SULPHUR COMPANY. Freeport to develop new sulfur deposit. Chem. Eng. Progress 47, no. 9: 34 (News) (September, 1951); Paper Mill News 74, no. 35: 7 (Sept. 1, 1951).

The development of a new sulfur deposit at Garden Island Bay, La., has been announced. Plans are under way for the construction of a mining plant which is expected to be ready for operation in 1953. An annual production of 500,000 long tons is being planned for and will be a major factor in solving the current world shortage of sulfur. 1 illustration. M.W.

SURFACE AREA

BARRER, R. M., and GROVE, D. M. Flow of gases and vapours in a porous medium and its bearing on adsorption problems. Part I. The steady state of flow. Trans. Faraday Soc. 47, no. 8: 826-37 (August, 1951).

A study has been made of the steady state of flow of helium, neon, argon, krypton, hydrogen, oxygen, nitrogen, ammonia, carbon tetrachloride, and sulfur dioxide through a bed of small, nearly spherical synthetic analcite crystals. Flow rates, permeabilities, Knudsen and Poiseuille contributions to permeability, and permeability constants have been determined and used to

test the applicability of several equations of flow. Significant deviations from the behavior suggested by these equations have been observed, especially for vapors. Pore properties and total surfaces have been determined by procedures based on steady-state flow data. 4 tables and 5 figures. E.S.

BARRER, R. M., and GROVE, D. M. Flow of gases and vapours in a porous medium and its bearing on adsorption problems. Part II. Transient flow. Trans. Faraday Soc. 47, no. 8: 837-44 (August, 1951).

By measuring the time lag L in setting up the steady state of flow, one may measure the diffusion coefficients of gases in a porous medium and obtain a mean pore radius and an internal surface of the porous medium independently of all steady-state methods. In beds of analcite crystals the inert gases, permanent gases, and carbon tetrachloride behave as though they were not adsorbed appreciably at low pressures, whereas ammonia and sulfur dioxide show strong adsorption effects. In very dilute adsorbed films of ammonia and sulfur dioxide, surface diffusion, although not necessarily absent, is limited in extent. The lifetimes τ of molecules in the adsorbed states are then given by the equations:

$$NH_3: \tau = 3.1 \times 10^{-11} \exp (4300/RT) \text{ sec.}$$
$$SO_2: \tau = 6.6 \times 10^{-11} \exp (3010/RT) \text{ sec.}$$

2 tables and 2 figures. E.S.

SYNTHETIC FIBERS

NEWELL, WILLIAM A. Production of newer synthetics follows course of rayon. Textile World 101, no. 9: 104-19, 123-6 (September, 1951); *cf.* B.I.P.C. 20: 125.

A review of the synthetic textile industry is presented in which data on the growth in production of rayons, acetate, nylon, vinylidene chloride, polyethylene, vinyl resins, glass, and azlon are presented. New fibers and new producers are mentioned, and the use of x-ray diffraction diagrams is discussed briefly. The addresses of some fiber producers and the various products of several manufacturers are listed in tabular form. A table in which are listed the properties of the synthetic textiles and the comparative properties of natural fibers is also included and is supplemented by a chart of foreign producers of synthetic yarns and fibers. 5 tables. M.W.

SCOTT, RICHARD C. Man-made fibers in '50 show greatest percent gain. Textile World 101, no. 9: 120-2 (September, 1951).

A series of charts is presented which furnish the following information: (1) the U. S. synthetic fiber production picture since before the war, (2) the world production picture, (3) the U. S. fiber consumption picture, (4) annual average yarn and raw material prices, (5) rayon exports and imports, and (6) U. S. hosiery production data. 16 tables and 2 figures. M.W.

ULTRASONICS

TOMBERG, V. Effects of ultrasonic irradiation on the coagulation of cellulosic solutions (viscose). Nature 168, no. 4268: 292-3 (Aug. 18, 1951).

Initial results concerning the effects of ultrasonic irradiation on the coagulation of cellulosic solutions and on the quality of the cellulosic lump obtained after regeneration are reported. The coagulation and regeneration rate of a mixture of viscose and diluted spinning-bath solution was decelerated, and the sample subjected to ultrasonic irradiation of a constant trans-

mitted dose at three different frequencies. A constant temperature was maintained. The viscose was irradiated both before and after mixing with the coagulating solution. The three principal effects were: (1) outgassing by expulsion of included minute bubbles, (2) acceleration of the rate of coagulation and regeneration, and (3) acceleration of dissolving and diffusing action of the spinning solution within the viscose. No remarkable differences as a result of change in the frequency were found, and macroscopic thermal effects did not seem to interfere. The regenerated lump had an increased mechanical consistency, but the possibility of structural changes is still under investigation. 1 diagram and 3 references. M.W.

VANILLIN

PEARL, IRWIN A., and BEYER, DONALD L. Reactions of vanillin and its derived compounds. XIII. A new synthesis of vanillic acid esters. J. Am. Chem. Soc. 73, no. 9: 4091-3 (September, 1951); *cf.* B.I.P.C. 21: 500.

The failure to prepare long-chain alcohol esters of vanillic acid by direct esterification procedures from vanillic acid led to the investigation of the hydrolysis of iminoether hydrochlorides obtained by treating vanillonitrile with long-chain alcohols and hydrogen chloride. The long-chain alkyl vanillimidate hydrochlorides were easily prepared in good yields. Hydrolysis of these with water alone gave good yields of the normal hydrolysis products, namely, long-chain alkyl vanillates and ammonium chloride. Small amounts of the abnormal hydrolysis products, vanillonitrile and long-chain alcohol, were also obtained in each case. The long-chain alkyl vanillates have the same ultraviolet spectra as other vanillic acid esters and appear useful for the same purposes. Except for the specific activity of the octyl and decyl vanillates toward the spore-forming *Bacillus mycoides*, the long-chain alkyl vanillates appear to be very poor antimicrobic agents. 2 tables, 1 figure, and 12 footnotes. E.S.

VENTILATION

J. O. ROSS ENGINEERING CORPORATION. Installations. Paper Trade J. 133, no. 10: 174-6, 178 (Sept. 7, 1951).

Recent installations, including hoods, and air and exhaust systems, in various paper mills are described briefly. 4 illustrations. M.W.

WASTE PAPER

BECKWITH, WILLIAM H., BETTENDORF, HARRY J., and HELME, ROY V., JR. Wastepaper statistics. Fibre Containers 36, no. 8: 122-9 (August, 1951); *cf.* B.I.P.C. 21: 52.

In 1950, waste-paper receipts were the highest on record, reaching almost 7,900,000 tons; consumption was also at a high level, but fell slightly short of the record 1947 consumption of 8,009,000 tons. Judging from the trends in the first six months, 1951 should prove to be a record year for both receipts and consumption. The importance of cleanliness in waste-paper collections is emphasized, and the use of 72-inch power balers is considered the first step in producing quality, particularly when these balers are employed in conjunction with conveyor and duster systems. Dealers and mills alike have found that the use of the rules as set forth in the Code of Waste Paper Standards and Practices (*cf.* B.I.P.C. 19: 662) promotes greater harmony within the industry. Of the 7,903,600 tons consumed in 1950, 82.3% was used for board, 5.9% for roofing, and 11.8% for paper. Raw straw consumption in 1950 was 405,800 tons, an increase of 20,000 tons over 1949,

but still much below the peak level of 1941 when 575,300 tons were used. Numerous tables, diagrams, and pie and block charts. E.S.

WATER AND WATER TREATMENT

ANON. Thunder Bay's new water system completes six months' trial. Can. Pulp and Paper 4, no. 9: 8-9 (September, 1951).

A recently installed additional water system for the paper mill at Thunder Bay is described, which is designed to provide 8000 gal./min. of water. 8 figures. M.W.

DAVIDSON, J. H. Color removal of process waters. Tappi 34, no. 9: 407-9 (September, 1951).

The Rainy River water has a high color (ranging from 40 to 80 p.p.m.) which renders it unsuitable for use as a process water in the manufacture of bleached pulp and paper. This color is satisfactorily removed in the Minnesota and Ontario Paper Co.'s mill at International Falls, Minn., by coagulation with alum and lime in its 15,000,000-gal./day filtration plant which consists of two horizontal Permutit precipitators and five gravity filters. About 2.25 g./gal. of alum and 1.5 g./gal. of lime are employed plus, when required, from 1 to 2 g./gal. of clay. Prechlorination with from 6 to 10 p.p.m. of chlorine is practiced, which usually furnishes a sufficient residual in the effluent so that post-chlorination is only occasionally required. The cost of the chemicals used averages somewhat less than 1.5 cents/1000 gallons. The filtered water is used in the new 200-ton/day bleach plant. Its purity, low color (2 to 4 p.p.m.), and lack of turbidity make it excellent for use in the production of high-brightness pulps and papers. The filtration plant was put into service in September, 1948 and has been in continuous operation since that date. 2 tables and 6 figures. E.S.

NOVIKOFF, PHILIP A. Water trouble-shooters. Can. Pulp and Paper 4, no. 9: 10-12 (September, 1951).

The research and testing work of the Alchem Limited laboratory, Burlington, Ont., in the softening and purification of water is described. 9 illustrations. M.W.

RIDDICK, THOMAS M., LINDSAY, NORMAN L., and TOMASSI, ANTONIO. Freezing of water in exposed pipelines. J. Am. Water Works Assoc. 42, no. 11: 1035-48 (November, 1950); Tappi 34, no. 9: 24A, 26A, 28A, 30A, 32A, 34A, 38A, 40A (September, 1951).

A study is described for evaluating the factors which control the freezing of water in exposed pipelines installed in cold climates; the survey was made in connection with a water-filtration plant for a proposed pulp mill. Data on types of freezing, limnological considerations, heat input, heat losses by conductivity, radiation, and convection, and the application of these principles are included. The logical methods of preventing the freezing of exposed pipelines are the withdrawal of the warmest water possible from the bottom strata of a reservoir, the provision of a high-velocity flow in the pipe (hence, a short detention period), blowoff of water to waste at the end of the pipeline, and the checking of heat losses by means of insulation. When waters are untreated, blowoff is readily possible. However, if a treatment plant is employed, its capacity may limit such a procedure. Insulation provides a possible solution and is not prohibitive in price, and the use of such materials as wood or Foamglas seems economically feasible. If the line can

be enclosed in any type of cover so as to produce several inches of dead air space around the pipe wall, freezing would be practically impossible, even under severe conditions. 6 tables, 2 figures, and 10 references. E.S.

WAXES

ANON. The use of waxes in sealing and protection. Parts 1 and 2. Brit. Packer 13, no. 4: 22-4; no. 8: 18-20 (April, August, 1951).

The general uses, methods of application, and properties of waxes are discussed, and several examples of specific applications and specifications are given. 8 figures. M.W.

WET STRENGTH

HARTSUCH, PAUL J. Modern trends in lithography. Printing Equip. Engr. 81, no. 12: 60-2 (September, 1951).

Among the recent developments in lithography, the author mentions the use of a high wet-strength paper wrapper for the damper rollers. It is removed and replaced when it becomes dirty, and eliminates the problem of cleaning the rollers. M.W.

KELLEHER, DENIS. James Bayley Butler, M.A., M.B., B.Ch., B.A.O., Ireland's inveterate inventor. Paper Maker [U. S.] 20, no. 2: 49-55 (September, 1951).

A brief biographical sketch of Professor Butler is presented, and some of his inventions, including the process for wet-strength paper, are described. 7 illustrations. M.W.

WOOD—CHEMISTRY

BUBLITZ, WALTER J. An investigation of the carbohydrate fraction of spruce chlorite liquors. Tappi 34, no. 9: 427-32 (September, 1951).

In the application of a modified method for the treatment of liquors derived from the sodium chlorite oxidation of sprucewood under conditions suggested for the quantitative isolation of holocellulose, a large alcohol-insoluble fraction, predominently carbohydrate in nature, has been isolated. On analysis, this fraction yielded large amounts of mannose, galactose, and uronic acids, with smaller quantities of xylose and arabinose. Within the range of experimental cooking conditions, analogous fractions could be isolated from all chlorite liquors, even from oxidations under milder conditions than those previously suggested. It is evident that the use of sodium chlorite for the isolation of holocellulose is not a quantitative method for the separation of lignin from carbohydrates; some carbohydrate material is removed before all the lignin is eliminated from the wood. 4 tables, 2 figures, and 29 references. E.S.

WOOD—DECAY

BASHAM, J. T. The pathological deterioration of balsam fir killed by the spruce budworm. Pulp Paper Mag. Can. 52, no. 9: 120-2, 125-6, 128, 130, 133-4 (August, 1951).

Since 1946 a study has been carried out by the Forest Insect Laboratory, Sault Ste Marie, Ont., on the pathological aspects of the deterioration of balsam fir killed by a recent spruce budworm outbreak in Ontario. It was found that on a volume basis 92.4% of advanced deterioration was due to

Polyporus abientinus (Dicks.) Fr., a member of the "white rot" group of wood-destroying fungi. The remaining 7.6% was caused by fungi of the "brown rot" class. In trees which had been dead less than a year the amount of advanced deterioration was negligible, and an average of 87.9% of the total merchantable volume was recoverable. Trees dead for one to two years had an average of 25% of their merchantable volume in a state of advanced decay, and 65.9% was recoverable. These percentages continued to increase with time but at a slower rate after three years. Summer-killed and faster-growing trees showed a higher rate of deterioration than winter-killed and slow-growing trees. A discussion of the effects of decay in the utilization of the wood as pulp is given, and it is concluded that wood in which decay has not advanced to too great an extent can be used, but only in the sulfite process. Balsam fir salvaged within one year will produce pulp with negligible reductions in yield and quality. After the timber has been dead for three years or longer, there is little chance of a profitable salvage operation. 6 tables, 25 figures, and 17 references. M.W.

WOOD—MENSURATION

BASSIN, J. Calculation of the cubic volume of poles. Paper and Timber (Finland) 33, no. 8: 260-3 (August, 1951). [In Finnish; English summary]

The author has prepared a new table for calculating the volume of wooden poles which, although not perfect, eliminates some of the irregularities resulting from an insufficient number of specimens measured, on which previous tables were based. Emphasis is placed on the fact that each wooden pole differs from the next and that, if the only available data are the diameter and length, it is impossible to obtain the exact volume through a table. 1 table and 3 diagrams. E.S.

WOOD OPERATIONS

CARLSON, W. S. The mechanical handling and movement of pulpwood on the limits of the LongLac Pulp and Paper Company Ltd. Pulp and Paper Manual of Canada 19: 9-13, 15, 17 (1951).

Several operations, based on summer work, for both 8-foot and 16-foot pulpwood are described. 1 table and 14 figures. M.W.

HOLT, LEIF. Introduction to discussion "Cutting methods in pulpwood logging operations of eastern Canada." Pulp and Paper Manual of Canada 19: 21, 23 (1951).

The author summarizes a previous paper in which he discusses growth factors, the suitability and costs of the different cutting methods under various conditions, the form of stands, and the influence of regeneration cutting methods on subsequent growth. M.W.

REYNOLDS, S. R. Pulpwood production costs and methods in southeastern Arkansas. Southern Pulp Paper Manuf. 14, no. 9: 28, 30, 32 (September, 1951).

Data on felling and bucking, skidding and bunching, loading and hauling separately, and on total production costs from the 1950 pulpwood cost study by the Southern Forest Experiment Station are presented, which indicate that the total average cost of delivering the wood today is 223% more than it was 10 years ago. In 1940, pine pulpwood in southeastern Arkansas was cut, bunched, loaded on trucks, hauled an average of eight miles to the mill

or railroad, and unloaded for $3.45 per standard cord; today this cost amounts to $11.14, although the wood is hauled somewhat farther (up to 20 miles). 2 tables and 2 figures. E.S.

WOOD TRANSPORTATION

COLLIER, R. D. Progress in skidding by wire. Pulp and Paper Manual of Canada 19: 27, 29, 31 (1951).

The procedure and equipment used in skidding by wire and recent developments in the use of expendable slings and in multiple-span wire skidding are discussed. A list of equipment is appended. 1 illustration. M.W.

WOOL

ANON. The mildewing of wool. Wool Science Rev. 6: 31-42 (1950).

In a general discussion of the causes and prevention of mildewing of wool, the rotproofing of papermakers' felts is mentioned. Bacterial degradation of the felt may be prevented by maintaining the paper stock at a pH below 6, by washing off the felt and/or treating the pulp with phenylmercuric acetate, or by treating the felt itself with one of the phenylmercuric compounds or copper chromate. The principal difficulty encountered in treating the felt is leaching of the antiseptic. Although wetting agents and other fixatives have been developed which reduce this problem, the most effective prevention of bacterial degradation can be achieved by treatment of the pulp rather than by proofing of the felt. 8 figures and 10 references. M.W.

X-RAY RESEARCH

KAST, W. Net structure and orientation in cellulose fibers. Makromol. Chem. 6, Staudinger Festband: 114-26 (March, 1951). [In German]

The author discusses the effect of stretching of cellulose fibers in the light of the theoretical deliberations of Kratky (*cf.* B.I.P.C. 14: 158) and Hermans and co-workers (*cf.* B.I.P.C. 17: 210-11) on the deformations of cellulose gels. 6 figures and 14 references. E.H.

YEAST

MCGINN, E. P. Rhinelander yeast plant. Paper Trade J. 133, no. 10: 96, 98-100 (Sept. 7, 1951); *cf.* B.I.P.C. 22: 60.

The installation for the production of yeast from spent sulfite liquor at the Rhinelander Paper Co. is described. 3 tables, 11 figures, and 1 flow diagram. M.W.

Patent Section

Although the abstracts of the United States and Canadian patents are prepared from the patents themselves, the initial selection of the patents to be abstracted is made from the Patent Gazette *and the* Canadian Patent Office Record *and, therefore, it is possible that the patent section will not contain all patents of potential interest to the industry. In so far as possible, an attempt will be made to indicate patents issued in both countries.*

The patent abstracts are listed under the various headings currently used for the abstracts of periodical articles.

Printed copies of United States patents can be obtained from the Commissioner of Patents, Washington, D.C.; the price is 25 cents per copy. Canadian patents up to and including December, 1948, are available only as manuscripts or photostatic copies, and an estimate of the cost of a patent should be obtained from the Commissioner of Patents, Ottawa, Canada, in advance of the order. With January, 1949, printed copies of Canadian patents are available at 25 cents per copy of less than 50 sheets of printed matter. For patents of 50 sheets or over, the price is $1.00 per copy. Beginning with volume 21, the Canadian patents will be abstracted from the complete specifications.

ALKALINE PROCESSES—RECOVERY

LONNGREN, HARALD E. Art of treating black liquors. U. S. patent 2,568,239. Filed March 29, 1949. Issued Sept. 18, 1951. 2 claims. [Cl. 202-14]

A process for the recovery of kraft black liquor comprises the steps of providing a distillation zone which contains a downwardly moving bed of refractory pebbles; continuously feeding pebbles at a temperature of 1000-1800°F. to the top of the bed; continuously spraying a black liquor feed which contains 50% solids onto the top of the bed at 200°; passing the liquor and pebbles concurrently downward through the distillation zone, where the heat content of the pebbles acts to dry the liquor to a frangible solid; removing the gaseous products from the top of the zone and the dried liquor and pebbles from the bottom of the zone; passing the dried liquor and pebbles separately into a combustion zone, where the dried liquor and any of the material adhering to the pebbles is burned, and the pebbles are heated by the resultant heat of combustion; and recycling the heated pebbles as the feed to the top of the distillation zone. 2 figures.

E.G.S.

ASPLUND PROCESS

MESSING, HJALMAR S. Devices for discharging fibrous materials from high pressure systems. Canadian patent 476,669. Filed Feb. 12, 1949. Issued Sept. 4, 1951. 11 claims. Assigned to American Defibrator, Inc.

A stock-discharge device which is adapted for use in conjunction with an Asplund Defibrator is equipped with a quick-opening control and a micrometer- or screw-opening control for adjusting the device for variable discharge. 7 figures.

E.G.S.

BARKERS AND BARKING

MCCLAY, GORDON F. Hydraulic bark remover having certain nozzles controlled by log-interrupted light beam. U. S. patent 2,568,554. Filed Jan. 26, 1949. Issued Sept. 18, 1951. 8 claims. Assigned to Ingersoll-Rand Company. [Cl. 144-208]

A hydraulic barker includes means for maintaining the lengths of the hydraulic jets substantially constant, irrespective of variations in the diameter of the log. 3 figures. E.G.S.

BOARD, ASBESTOS

GREIDER, HAROLD W., and SMITH, MARION F. Asbestos sheet material and method of manufacture. U. S. patent 2,567,558. Filed Dec. 29, 1944. Issued Sept. 11, 1951. 15 claims. Assigned to The Philip Carey Manufacturing Company. [Cl. 117-126]

The asbestos fibers of a flexible, felted-fiber asbestos paper are interbonded *in situ* by interaction with a solution of sulfuric acid, ammonium sulfate, or magnesium acid sulfate. Any organic material in the paper constitutes less than 10% by weight of the fiber plus any filler incorporated in the sheet. E.G.S.

GREIDER, HAROLD W., and SMITH, MARION F. Asbestos sheet material and method of manufacture. U. S. patent 2,567,559. Filed Dec. 29, 1944. Issued Sept. 11, 1951. 20 claims. Assigned to The Philip Carey Manufacturing Company. [Cl. 117-126]

A flexible, bibulous, felted-fiber asbestos paper comprises asbestos fibers which have been interbonded *in situ* by reaction with a water-soluble inorganic phosphate (e.g., sodium or potassium acid phosphate; monobasic or tribasic sodium phosphate; monobasic, dibasic, or tribasic ammonium phosphate; or the like) to provide a tensile strength of at least 5 pounds per linear inch. For sheet thicknesses up to 0.05 inch, the paper can be bent 180° around a 1.5-inch diameter mandrel in two seconds at 77°F. without rupture or breaking at the surface. E.G.S.

BOARD, CORRUGATED

MCKEE, ROBERT C. Corrugated board and method of making same. U. S. patent 2,568,349. Filed June 22, 1950. Issued Sept. 18, 1951. 6 claims. Assigned to The Institute of Paper Chemistry. [Cl. 154-33.05]

A corrugated board or containerboard is described which has good tear- and crush-resistant qualities, particularly when subjected to severe atmospheric conditions, such as prolonged storage in a damp atmosphere. As an example, a containerboard comprises a corrugating medium which includes a Fourdrinier-kraft base sheet (26 lb. per 1000 sq. ft., uncorrugated) and 60% by weight (based on the fiber) of elemental sulfur as an impregnant; Fourdrinier-kraft top and bottom liners (47 and 69 lb. per 1000 sq. ft., respectively); and a starch adhesive (5 lb. per 1000 sq. ft.). The medium is corrugated with a draw of 1.4. The finished board has a total weight (dry basis) of 179 lb. per 1000 sq. ft. 4 figures. E.G.S.

BOARD, INSULATING

HJÄRTSÄTER, JACOB J. Sound absorbing fibrous material for covering the walls or ceilings of rooms. U. S. patent 2,567,070. Filed March 22, 1948. Issued Sept. 4, 1951. 8 claims. [Cl. 181-30]

A fibrous acoustical board is formed with a number of continuous grooves cut closely adjacent to each other on the exposed side of the board; the grooves are arranged so that shallow portions alternate with deep portions. The profile of the grooves may be that of a waveline or approximately a waveline, with the crest rounded, flattened, or pointed. 5 figures. E.G.S.

BOARD SPECIALTIES

HARVEY, WILFRED G. Package for novelty items. U. S. patent 2,568,625. Filed March 5, 1948. Issued Sept. 18, 1951. 2 claims. [Cl. 206-78]

A display package for novelty items comprises an opaque cardboard display card and a transparent plastic or glass container which is retained in an aperture in the card. 4 figures. E.G.S.

KRIHWAN, JULIUS O. Merchandise package. U. S. patent 2,566,667. Filed Feb. 27, 1948. Issued Sept. 4, 1951. 3 claims. Assigned to Talon, Inc. [Cl. 206-78]

A paperboard display package for slide fasteners is constructed in the form of a folder or envelope which bears advertising matter and illustrated instructions. This corresponds to Canadian patent 473,147; *cf.* B.I.P.C. 21: 745. 8 figures. E.G.S.

NICHOLS, GORDON E. Method of making calendar mounts. U. S. patent 2,568,458. Filed Dec. 12, 1947. Issued Sept. 18, 1951. 19 claims. Assigned to Winthrop-Atkins Co., Inc. [Cl. 154-125]

A method is described for the assembly of easel-type cardboard mounts for calendar pads or photographs. 6 figures. E.G.S.

CHLORINE

HELLER, HAROLD H., and SAUNDERS, GEORGE H. Methods and apparatus for the electrolysis of brine. Canadian patent 476,519. Filed June 28, 1948. Issued Aug. 28, 1951. 11 claims. Assigned to Paper Patents Company.

An improvement in the method of producing chlorine by the electrolysis of a sodium chlorine brine in a mercury cell comprises the propulsion of the brine across the surface of the anode and the cathode at such a rate and under such conditions that the Reynolds number of the brine is at least 4000, and movement of the mercury of the cathode in the same direction as the brine. 5 figures. E.G.S.

CHLORINE DIOXIDE

HALLER, JOHN F. Processes for making chlorine dioxide. Canadian patent 476,501. Filed Jan. 19, 1949. Issued Aug. 28, 1951. 7 claims. Assigned to Mathieson Chemical Corporation.

Chlorine dioxide is generated by the action of a stream of diluted nitrogen dioxide (40 liters of air and 4 liters of nitrogen dioxide) on a mixture of equal volumes of 72% aqueous nitric acid and water saturated at 25°C. with respect to sodium chlorate and sodium nitrate. The solution contains 1.532 moles of chlorate ion. After two hours, 95.3% of the available chlorate is converted to chlorine dioxide. The reaction can be carried out at 15-35°. This is the same as U. S. patent 2,451,826; *cf.* B.I.P.C. 19:288. 2 figures. E.G.S.

DIGESTERS

KEHOE, RICHARD D. Wood digesting apparatus. Canadian patent 476,298. Filed June 7, 1949. Issued Aug. 21, 1951. 4 claims. Assigned to Paper and Industrial Appliances, Inc.

An apparatus is provided for use in conjunction with the apparatus disclosed in U. S. patent 2,323,194, issued June 29, 1943 to Beveridge and Kehoe. Briefly, the earlier patent covers a nonflooded, vapor-bearing, heat and pressure chamber into which wood chips are continually supplied through a restricted, necklike feed conduit wherein the chips are compressed and compacted to form a plug which prevents the loss of pressure during the feeding operation. The current patent provides for the feeding of the plug to the chamber under conditions such that the plug is mechanically broken up, and that the action of the chamber atmosphere on the chips is facilitated. 3 figures. E.G.S.

DISPENSING CONTAINERS

GILLESPIE, DWIGHT E. Paper receptacle. U. S. patent 2,567,017. Filed Nov. 19, 1946. Issued Sept. 4, 1951. 3 claims. Assigned to Owens-Illinois Glass Company. [Cl. 229-17]

A paper container for liquids or powdered, granulated, or comminuted dry material incorporates a hinged or movable top panel which carries a sanitary pouring spout with a pour opening which is closed and sealed when the top panel is in its lowered position. 5 figures. E.G.S.

FOLDING BOXES

RINGLER, WILLIAM A. One-piece lined box. U. S. patent 2,568,170. Filed May 18, 1946. Issued Sept. 18, 1951. 12 claims. Assigned to The Gardner Board and Carton Co. [Cl. 229-14]

A glassine-, parchment-, or cellophane-lined frozen food container which is formed from a single sheet of paperboard incorporates a covered inspection window. 10 figures. E.G.S.

INSULATION AND INSULATING MATERIALS

CREMER, FREDERICK, and UNICK, HENRY F. Felted material and method of making the same. U. S. patent 2,568,144. Filed Dec. 5, 1945. Issued Sept. 18, 1951. 15 claims. Assigned to Union Asbestos & Rubber Company. [Cl. 154-101]

A method is described for making a water-resistant, felted insulating material in which the fibers (e.g., asbestos, glass, or the like) are first coated with a water-repellent composition (e.g., butyl phenolic resin) and are subsequently sprayed with an aqueous binder solution (e.g., alkaline sodium silicate, acidic aluminum phosphate, or a phenol-formaldehyde resin) to form separated globules of binder at the points where the fibers engage each other. 4 figures. E.G.S.

MACHINERY—BEATERS

SKARDAL, KARL A., and BÖRJESON, OLOV B. Waste paper dissolving machines. Canadian patent 476,357. Filed March 31, 1950. Issued Aug. 28, 1951. 6 claims.

A broke beater comprises a beater tub in the bottom of which is mounted a circulation pump; the path of circulation within the unit includes a narrow passage through which the contents of the vessel must pass before being discharged from the beater. The circulation pump may also act as an emptying pump. 4 figures. E.G.S.

MACHINERY—CHIPPERS

JOHNSON, CHARLES A. Seating means for wood chipper bed

knives. U. S. patent 2,566,938. Filed May 13, 1948. Issued Sept. 4, 1951. 5 claims. [Cl. 241-92]

A chipper is provided with a knife base in which the knife is self-seating and firmly held in proper spaced relation to the rotating cutting knives. 5 figures. E.G.S.

MACHINERY—CONVERTING MACHINERY

BUCKLEY, CHARLES W., and BAILEY, EDGAR P. Method and apparatus for making containers. U. S. patent 2,568,382. Filed June 14, 1946. Issued Sept. 18, 1951. 15 claims. Assigned to Wright Machinery Company. [Cl. 93-51]

A method and apparatus are adapted for the manufacture of hermetically sealed, moisture- and odor-impervious food containers from laminated sheets of metal foil and paper. 35 figures. E.G.S.

GILCHRIST, JOHN. Methods of and apparatus for forming and assembling egg cartons. Canadian patent 476,130. Filed Dec. 7, 1948. Issued Aug. 14, 1951. 20 claims. Assigned to Somerville Limited.

A method and apparatus are described for the formation and assembly of egg cartons. The walls of the carton blank are creased without bending, except along a medial line, and then subjected to a slotting and cross partition-inserting operation before the walls are bent along their crease lines to overlie the inserted cross partitions. 73 figures. E.G.S.

GOEPFERT, OTTO F. Cigarette paper booklet machine. U. S. patent 2,567,201. Filed June 1, 1945. Issued Sept. 11, 1951. 5 claims. Assigned to Ecusta Paper Corporation. [Cl. 270-41]

A high-speed automatic machine for the manufacture of cigarette paper booklets includes a device for the scoring of the cardboard cover material in continuous strip form. This corresponds to Canadian patent 467,183; *cf.* B.I.P.C. 21: 134. 15 figures. E.G.S.

HEYWOOD, VINCENT E. Flap gumming and folding mechanism for envelope machines. U. S. patent 2,568,629. Filed July 13, 1948. Issued Sept. 18, 1951. 3 claims. Assigned to United States Envelope Company. [Cl. 93-62]

A high-speed, rotary-type envelope machine is provided with simplified flap-gumming and folding means. 12 figures. E.G.S.

MACHINERY—FELTS

BERGLUND, ORION W. Multiple impregnation of papermaker's felt. U. S. patent 2,567,097. Filed Dec. 23, 1946. Issued Sept. 4, 1951. 5 claims. Assigned to The Orr Felt & Blanket Company. [Cl. 117-76]

An abrasion-resistant papermaking felt is claimed to exhibit a high degree of wettability and a low wetting time. The felt comprises a dimensionally stable, woven wool base which is impregnated with 5-15% by weight of urea- or phenol-formaldehyde resin, and a superimposed layer of synthetic rubber (e.g., acrylonitrile- or styrene-butadiene copolymer, or polychloroprene). The total pickup of coating is limited to approximately 10-25%, with the result that the fibers remain unmatted. E.G.S.

MACHINERY—GRINDERS

COLE, LORNE A. Methods and apparatus for regulating power used by pulp grinders. Canadian patent 475,983. Filed June 2, 1948. Issued Aug. 14, 1951. 24 claims.

A pressure-control unit is adapted for use in conjunction with a pulp grinder. The grinding pressure which is applied to the logs by a pressure-foot piston under load is governed by means of a variable back pressure from a low-pressure line, applied to the front of the piston. This corresponds to U. S. patent 2,545,260; *cf.* B.I.P.C. 21: 597. 20 figures. E.G.S.

MACHINERY—HEAD BOX

HORNBOSTEL, LLOYD. Stock distributors. Canadian patent 476,675. Filed March 30, 1949. Issued Sept. 4, 1951. 27 claims. Assigned to Beloit Iron Works.

A crossflow-type stock distributor for a Fourdrinier or cylinder machine includes means for the elimination of eddy currents and crossflow velocities in the stock flowing into the machine; the stock stream is divided into two streams which are subsequently merged by gravity flow prior to the introduction of the stock onto the papermaking wire. 7 figures. E.G.S.

MACHINERY—PACKAGING MACHINERY

DEUTSCH, FRED M., WARZINIK, MORRIS, and MEIER, ANTON M. Method and apparatus for packaging. U. S. patent 2,567,598. Filed Nov. 24, 1945. Issued Sept. 11, 1951. 35 claims. Assigned to Marathon Corporation. [Cl. 93-6]

A method and apparatus for the packaging of fresh or frozen foods are adapted for setting up flat, collapsed cartons, filling the cartons with the goods to be packaged, and closing the filled cartons while they are being continuously conveyed. 24 figures. E.G.S.

SALFISBERG, LEROY L. Alignment controlling packaging machines. Canadian patent 476,731. Filed July 13, 1949. Issued Sept. 4, 1951. 7 claims. Assigned to Ivers-Lee Company.

A machine for packaging tablets, pellets, powders, and the like between continuous strips of cellophane includes means for periodically registering or compensating for the misregister of indicia-bearing zones with their respective compartments. This is the same as U. S. patent 2,483,155; *cf.* B.I.P.C. 20: 686. 7 figures. E.G.S.

SANDBERG, OSCAR. Wrapping machine for sandwiches and the like. U. S. patent 2,567,405. Filed March 13, 1946. Issued Sept. 11, 1951. 7 claims. Assigned to Lynch Corporation. [Cl. 93-7]

A machine for the packaging of filled cracker sandwiches in Pliofilm, waxed paper, or cellophane wrappers is adapted to receive stacks of sandwiches on a pocket conveyor, convey the stacks successively to a predetermined station, and move them from such station into a folder head for partial wrapping. 21 figures. E.G.S.

MACHINERY—PASTING MACHINE

BELCHER, DANIEL, and KINDSETH, HAROLD V. Bag sealing machines. Canadian patent 476,237. Filed Jan. 6, 1949. Issued

Aug. 21, 1951. 18 claims. Assigned to Bemis Bro. Bag Company.

A paper bag-sealing machine comprises a suitable supporting frame upon which bag top-clamping jaws and their operating means are mounted; the frame is vertically adjustable to adapt the apparatus for handling bags of different heights. 12 figures. E.G.S.

MACHINERY—PRESSES

LESNIAK, FRANK G. Plural intermeshing feed or press screws. U. S. patent 2,567,219. Filed Feb. 12, 1945. Issued Sept. 11, 1951. 5 claims. Assigned to Masonite Corporation. [Cl. 100-48]

An intermeshing screw construction is useful in the expression of liquid from liquid-containing material, as for example, the pressing of liquid from fiber stock or other vegetable and animal materials. The screws are rotated in the same direction and have critical relationships of thread angles and dimensions that impart good meshing and fitting properties and yet permit such rotation and the consequent opposite movement of the meshing parts of the respective screws. 12 figures. E.G.S.

MACHINERY—PULPERS

JONES, DWIGHT E. Continuously operating pulper. U. S. patent 2,567,885. Filed Aug. 10, 1949. Issued Sept. 11, 1951. 2 claims. Assigned to E. D. Jones & Sons Company. [Cl. 92-26]

The continuous operation of a pulper is accomplished in such a manner that broke, waste paper, or the like may be fed to the machine, and the resulting pulped stock discharged continuously. The unit includes apertured members at one or both ends of a rotor, in planes perpendicular to the axis of rotation of the rotor; impellers associated with the rotor cause the stock to pass over the perforated members at high velocity. Thus the pulped stock can pass through the perforations, and the members and an adjacent grate are kept clean. 3 figures. E.G.S.

MACHINERY—ROLLS

HORNBOSTEL, LLOYD. Diaphragm unit. U. S. patent 2,567,151. Filed July 30, 1945. Issued Sept. 4, 1951. 5 claims. Assigned to Beloit Iron Works. [Cl. 267-1; changed to 137-157]

A diaphragm unit is adapted for use in a fluid pressure-controlled roll assembly in a papermaking machine; the unit includes axially deflectable members for imparting lateral stability to the unit without resisting the axial movement of the diaphragm. 7 figures. E.G.S.

MACHINERY—SHEET-FEEDING MECHANISM

DANIELS, FLAVIUS K. Means for automatically and intermittently feeding blanks of cardboard or similar sheet material. Canadian patent 476,144. Filed Sept. 19, 1947. Issued Aug. 14, 1951. 10 claims. Assigned to Vickers-Armstrongs Limited.

A machine is adapted for the automatic and intermittent feeding of cardboard blanks, as for example, to a box-stitching machine. At least one of each pair of co-operating rotary feed elements, which may be feed disks or rollers, is given a positive, oscillating, rotary motion, with a stationary dwell at each extremity of the rotary motion. One direction of rotation affords positive feeding, whereas the other direction of rotation is merely a return motion. 8 figures. E.G.S.

MACHINERY—THICKENERS

THOMSON, WILLIAM R. Filter apparatus. U. S. patent 2,568,420. Filed March 6, 1947. Issued Sept. 18, 1951. 3 claims. [Cl. 210-197]

A pulp thickener is similar in construction to a horizontal-type filter apparatus which was described in U. S. patent 2,101,109, issued Dec. 7, 1937. A rotary filter is operated in conjunction with the horizontal unit to promote more efficient operation. 4 figures. E.G.S.

PACKAGING

ANDREWS, EDWARD D. Method of packaging. U. S. patent 2,567,267. Filed May 20, 1947. Issued Sept. 11, 1951. 6 claims. Assigned to The Quaker Oats Company. [Cl. 93-3]

An individual cereal package comprises a rectangular cardboard sleeve and an outer wrapper of moisture-vapor resistant sheeting (e.g., moisture-proof cellophane, vinyl-vinylidene or rubber hydrohalide sheeting, or waxed paper) which is wrapped tightly about the sleeve and folded and sealed across both open ends of the sleeve. 10 figures. E.G.S.

PAPER—COATED

MONTGOMERIE, JOHN A. Coating of paper. U. S. patent 2,566,529. Filed Feb. 14, 1948. Issued Sept. 4, 1951. 11 claims. Assigned to Chemical Manufacturing Company. [Cl. 106-144]

A paper-coating composition comprises a dispersion of a vegetable resin in an aqueous casein solution. As an example, a casein solution is prepared from the following ingredients: 112.0 parts of casein, 6.6 parts of sodium hydroxide, and 626.0 parts of water (all by weight). Then 265 parts of the resultant solution are mixed with 100 parts of a rosin dispersion of the following weight composition: 60.0 parts of rosin, 6.6 parts of sodium hydroxide, and 200.0 parts of water. The resulting dispersion is dried. The dispersion is re-established by the addition of 10 parts of a china clay slurry which contains equal parts of china clay and water to 42 parts of the dried composition, with suitable agitation. The ratio of rosin to casein in the resulting composition is about 1:1.6. E.G.S.

MONTGOMERY, WILLIAM J. Method of coating paper. U. S. patent 2,568,288. Filed April 30, 1948. Issued Sept. 18, 1951. 23 claims. Assigned to The Champion Paper and Fibre Company. [Cl. 117-66; changed to 117-64]

A method is provided for the continuous production of a uniformly high-quality, cast-surfaced, coated paper. The coating adheres firmly to the casting surface until the coating has dried to a substantially nonplastic condition, and yet the dried, coated paper is consistently, completely, and cleanly detached from the casting surface throughout long, uninterrupted operation. As an example, the coating material is prepared by thoroughly mixing 100 parts (dry weight) of finely precipitated calcium carbonate, 13 parts of casein, and 0.5 part of zinc oxide, with sufficient ammonium hydroxide to dissolve the casein and form a complex zinc ammonium compound. During the mixing operation sufficient water is added to bring the total solids to about 60%. About one-sixth part by weight of oleic acid is incorporated in the resulting composition, and the whole is thoroughly mixed. Prior to application water is added to reduce the solids content of the mixture to approximately 55%. At this point about 0.02 part of tributyl phosphate is added. The casting surface is an internally heated, chromium-

surfaced rotating cylinder which is prepared before use by buffing with an impalpable abrasive powder thoroughly wetted with castor oil. The above-described composition is applied to one side of a 43-lb. (25 x 38—500) coating stock in excess of the required amount, and the paper is pressed against the finishing surface; thus the excess coating is squeezed off, and about 12 pounds of the material are left per ream, dry weight. E.G.S.

PAPER SPECIALTIES

BRADY, CHARLES V., and OTTINGER, AUGUST F. Bag of open-mesh material and paper. U. S. patent 2,565,754. Filed Oct. 9, 1948. Issued Aug. 28, 1951. 4 claims. Assigned to Bemis Bro. Bag Company. [Cl. 229-53]

A ventilated, open-mesh bag incorporates a relatively large area of imperforate material (e.g., kraft or creped paper) which is adapted to receive printing. The bag also includes a woven-in drawstring. 19 figures. E.G.S.

BRYCE, WILLIAM H. Paper bags. Canadian patent 476,058. Filed Nov. 4, 1949. Issued Aug. 14, 1951. 9 claims. Assigned to Dixie Wax Paper Company.

A moisture-vapor resistant glassine bag which is adapted for the packaging of potato chips includes a transparent inspection window. 11 figures. E.G.S.

COLEMAN, GERALD H., and WOLF, PAUL A. Fungistatic wrapper. U. S. patent 2,567,010. Filed Jan. 13, 1947. Issued Sept. 4, 1951. 3 claims. Assigned to The Dow Chemical Company. [Cl. 167-38.6; changed to 167-33]

A coated paper or regenerated cellulose food wrapper incorporates an effective fungistatic amount (at least 0.3% of the weight of the article) of dehydroacetic acid in the coating composition. E.G.S.

DAHLQUIST, CARL A., HENDRICKS, JAMES O., and SOHL, WILLIAM E. Low-adhesion polyvinyl carbamate coatings. Canadian patent 476,291. Filed April 28, 1947. Issued Aug. 21, 1951. 10 claims. Assigned to Minnesota Mining & Manufacturing Company.

A normally tacky, pressure-sensitive adhesive tape is provided with a paper backing which is coated on its inner face with a normally tacky, water-insoluble, rubbery-base, eucohesive, pressure-sensitive adhesive and which is backsized with a low-adhesion coating consisting of a hydrophobic polyvinyl *N*-alkyl carbamate (e.g., polyvinyl *N*-tetradecyl carbamate or polyvinyl *N*-octadecyl carbamate). The tacky adhesive is sufficiently inactive to the back surface of the tape to permit the tape to be unwound without delamination or breakage and without offset of the adhesive. 6 figures. E.G.S.

GALLEY, HOLLIS T. Photographic paper. Canadian patent 476,691. Filed Aug. 30, 1945. Issued Sept. 4, 1951. 6 claims. Assigned to Canadian Kodak Company.

A photographic base paper is prepared by coating one side of a high-alpha sheet with barium sulfate in an aqueous gelatin solution and, after drying, coating both sides of the sheet with a cellulose ester melt composition

which contains 75% cellulose acetate butyrate, 12.5% dibutyl sebacate, and 12.5% diamyl phthalate, at the rate of 10 lb./1000 sq. ft. of paper. This is the same as U. S. patent 2,415,631; *cf.* B.I.P.C. 17: 459-60. 1 figure. E.G.S.

GRUPP, ALFRED F., RATHKE, HARRY C., TALAN, ELWOOD S., and WATTS, ELMORE. Pressure sensitive decalcomania and method of making the same. U. S. patent 2,567,067. Filed Nov. 29, 1947. Issued Sept. 4, 1951. 16 claims. Assigned to The Meyercord Co. [Cl. 117-3.6]

A decalcomania of the pressure-sensitive type is described in which the adhesive layer, after application to the carrier paper, dries quickly to a dry, nontacky, nonpressure-sensitive adhesive, so that the sheets may be stacked during production without adhering to each other while awaiting application of the design prints. The adhesive layer becomes pressure-sensitive and tacky upon the application of additional layers thereover. 5 figures. E.G.S.

HAMM, HOMER A. Absorbent glass container. U. S. patent 2,568,623. Filed Aug. 10, 1946. Issued Sept. 18, 1951. 3 claims. [Cl. 65-61]

An absorbent sleeve or holder for a drinking glass comprises a relatively thick, annular, laminated body member, the inner portion of which is formed from several layers of creped wadding or Kimpak. The outer portion of the sleeve consists of a layer of waterproofed creped paper. 10 figures. E.G.S.

HANNUM, JOHN A., and EPEL, JOSEPH N. Moisture-destructible container. U. S. patent 2,567,706. Filed Jan. 9, 1946. Issued Sept. 11, 1951. 1 claim. Assigned to Hefco Laboratories. [Cl. 229-3.5]

A paper container is adapted to retain moisture around the roots of young plants subsequent to their placement in the ground. The receptacle is formed from a low-wet strength, highly absorptive paper (e.g., heavy sulfate blotting paper) which is coated on the inner surface with a frangible, extremely water-impervious composition (e.g., unplasticized polystyrene). 6 figures. E.G.S.

JULIEN, JOSEPHINE M. Catamenial bandage. U. S. patent 2,566,451. Filed March 24, 1950. Issued Sept. 4, 1951. 1 claim. [Cl. 128-290]

A catamenial pad is formed solely of plies of highly absorbent tissue paper (e.g., facial tissue) which have been pressed together. 4 figures. E.G.S.

KARDON, EMANUEL S. Bags and methods of making the same. Canadian patent 476,667. Filed Aug. 12, 1949. Issued Sept. 4, 1951. 2 claims. Assigned to American Bag & Paper Corporation.

A self-opening, satchel bottom-type paper bag is adapted for manufacture on an automatic bag-making machine. An inner liner seals the bottom of the bag against leakage. This corresponds to U. S. patent 2,496,796; *cf.* B.I.P.C. 20: 538. 9 figures. E.G.S.

MCWHORTER, MARIE W. Garment bag. U. S. patent 2,568,158. Filed Nov. 24, 1947. Issued Sept. 18, 1951. 1 claim. [Cl. 206-7]

A heavy-paper garment bag incorporates a removable closure panel which can move to accommodate itself to bends in the bag when the latter is folded. 8 figures. E.G.S.

REYNOLDS, RICHARD S. Method of adhering metal foil to nonmetallic carrying webs. U. S. patent 2,568,463. Filed Oct. 23, 1946. Issued Sept. 18, 1951. 9 claims. Assigned to Reynolds Metals Company. [Cl. 154-117]

A method for the lamination of metal foils (e.g., aluminum foil) to a nonmetallic carrying web (e.g., paper, cloth, regenerated cellulose, and the like) comprises the steps of passing a double-foil web to a rewinding operation while bringing it into contact with a carrying web; winding the contacting webs together with an adhesive material (e.g., waxes, gums, asphalts, thermoplastic resins, and the like) interposed between the foils and the carrying web; and bonding one of the foils to each side of the carrying web. 4 figures. E.G.S.

PHYSICAL TESTING—PAPER—SIZE RESISTANCE

MARTINET, NOËL. Method and apparatus for testing papers and the like. U. S. patent 2,568,199. Filed Feb. 17, 1948. Issued Sept. 18, 1951. 8 claims. Assigned to Société des Papiers et Cartons Couchés "Lux." [Cl. 175-183]

A method and apparatus are adapted for the determination of the ink permeability of paper and cardboard. The sample to be tested is placed between two electrodes which are inserted in a measuring circuit and is brought into contact with ink under given conditions of pressure and temperature. The permeability of the sample under test is determined by the time required by the current to reach a given value in the measuring circuit under constant-voltage conditions. 3 figures. E.G.S.

SETUP BOXES

VOGT, LUCIEN E. Boxes. Canadian patent 476,712. Filed June 17, 1949. Issued Sept. 4, 1951. 4 claims. Assigned to Farrington Manufacturing Company.

A method is described for the construction of boxes of various sizes, shapes, and materials, which incorporate external strengthening frames at the corners and along various edges. This is the same as U. S. patent 2,477,530; *cf.* B.I.P.C. 19: 899. 4 figures. E.G.S.

SHIPPING CONTAINERS

REESER, HARRY C. Container. U. S. patent 2,568,204. Filed Jan. 19, 1949. Issued Sept. 18, 1951. 4 claims. Assigned to The Patent and Licensing Corporation. [Cl. 229-34]

A fiberboard, boxboard, or corrugated board shipping container for fruits, vegetables, and the like incorporates corner braces which are designed to permit the stacking of a number of the filled, coverless cartons. 9 figures. E.G.S.

ROSENBERG, LEON J. Telescopic shipping carton. U. S. patent 2,567,786. Filed Oct. 17, 1947. Issued Sept. 11, 1951. 2 claims. Assigned to Gaylord Container Corporation. [Cl. 229-23]

A relatively tall, heavy-duty, corrugated board or fiberboard shipping container comprises an inner goods-receiving section and an outer slip-cover section which is adapted to telescope snugly over the open end of the inner section. 7 figures. E.G.S.

VADNER, SAMUEL. Packing and storage container. U. S. patent 2,567,832. Filed Jan. 31, 1949. Issued Sept. 11, 1951. 2 claims. [Cl. 229-23]

A fiberboard packing case or container for bottled beer and the like is reinforced in the region of the upper and lower edges of its handholes. 12 figures. E.G.S.

SHIPPING CONTAINERS—FIBER DRUMS

SCOTT, ARTHUR L. Method of producing paper drum containers. U. S. patent 2,568,664. Filed Oct. 16, 1947. Issued Sept. 18, 1951. 2 claims. [Cl. 93-36.8]

A method is described for the manufacture of a cylindrical container which has integral side and end walls from several convolutions of a continuous paper strip. One edge of the paper strip is formed with triangular serrations; the resulting triangular tabs are bent inwardly against a mandrel during a winding operation to form the bottom of the container. 8 figures. E.G.S.

SULFITE WASTE LIQUOR

STEWART, WILLIAM D. Horticultural composition comprising DDT and polyethylene polysulfide. U. S. patent 2,568,035. Filed April 11, 1947. Issued Sept. 18, 1951. 4 claims. Assigned to The B. F. Goodrich Company. [Cl. 167-22]

A horticultural spray composition comprises 0.5-10 parts by weight of 2,2-bis(*p*-chlorophenyl)trichloroethane and 1.0-5 parts of polyethylene polysulfide in the form of particles no greater than 1-4 microns in diameter, dispersed in an aqueous solution of a lignin sulfonate. E.G.S.

STEWART, WILLIAM D. Horticultural composition comprising polyethylene polysulfide and sulfur or lime-sulfur. U. S. patent 2,568,034. Filed April 11, 1947. Issued Sept. 18, 1951. 3 claims. Assigned to The B. F. Goodrich Company. [Cl. 167-20]

A horticultural spray composition comprises 1-10 parts by weight of elemental sulfur particles and 1-5 parts by weight of polyethylene polysulfide particles (no greater than 1-3 microns in diameter) dispersed in an aqueous solution of a lignin sulfonate. E.G.S.

VLOEBERGHS, ANTOINE. Agglomerates of fuel and manufacture process. U. S. patent 2,567,136. Filed Sept. 22, 1939. Issued Sept. 4, 1951. 6 claims. [Cl. 44-21; changed to 44-15]

A process for the manufacture of coal briquets comprises the steps of adding to coal dust a previously prepared mixture of spent sulfite liquor (up to less than 6%) and a phenol-formaldehyde resin (up to less than 3%); molding the resultant agglomerate; and subjecting the molded material to a temperature of about 100°C. in an oven. E.G.S.

TALL OIL

BURRELL, HARRY. Tall oil-pentaerythritol ester resins modified

with unsaturated acids. Canadian patent 476,278. Filed Aug. 30, 1945. Issued Aug. 21, 1951. 24 claims. Assigned to Heyden Chemical Corporation.

A varnish base is prepared by the substantially complete esterification of dipentaerythritol with the product formed by the reaction of tall oil which contains a large portion of its original resin acids and approximately 2-10% by weight (based on the tall oil) of maleic anhydride. E.G.S.

TEXTILE INDUSTRY AND FABRICS—FIREPROOFING

CLAYTON, EDWIN C., and HEFFNER, LAWRENCE L. Fire, water and mildew resisting fabrics and compounds for producing the same. Canadian patent 476,279. Filed April 8, 1942. Issued Aug. 21, 1951. 13 claims. Assigned to Wm. E. Hooper & Sons Company.

A fire-, water-, and mildewproofing agent for textiles (e.g., cotton duck) comprises approximately 25% of organic material (e.g., paraffin) which is about 20-70% chlorinated, has waterproofing properties, and is adapted to give off chlorine-containing gases at the combustion temperature of a fabric; approximately one fourth of this amount of antimony trioxide; approximately 15% of black iron oxide; and a solvent which can be eliminated from the fabric by evaporation. The organic chlorinated material retains a high degree of flexibility after the evaporation of the solvent and through an indefinite period of exposure. E.G.S.

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